FLORIDA A&M UNIVERSITY

**Board of Trustees**

# Academic and Student Affairs Committee Meeting

**Monday, May 20, 2024**
**10 a.m.**
**Zoom**

**Committee Members:** Nicole Washington, Chair
Ezzeldin Aly, Otis Cliatt, Deveron Gibbons, Kristin Harper, Kelvin Lawson, and Loryn May

## AGENDA

| | | |
|---|---|---|
| I. | Call to Order | Trustee Nicole Washington |
| II. | Roll Call | Ms. Valeria Singleton |
| III. | Minutes for March 6, 2024 Meeting (p. 3) | Trustee Washington |
| IV. | Follow-up Items (p. 9) | Trustee Washington |

## ACTION ITEMS

| | | |
|---|---|---|
| V. | Request for Leave of Absence (p. 10)<br>• Elise Simmons | Dr. Allyson Watson |
| VI. | Regulation 4.008 – Religious Holidays (p. 11) | Dr. Watson |
| VII. | Annual Reporting (p. 15)<br>• Annual General Education Review (NEW) | Dr. Sundra Kincey |
| VIII. | Credit Hour Reduction (p.20)<br>• Bachelor of Science in Biomedical Engineering<br>• Bachelor of Science in Chemical Engineering | Dr. Kincey |
| IX. | New Degree Recommendations for Approval (p. 23)<br>• Master of Science in Aerospace Engineering<br>• Doctor of Philosophy in Aerospace Engineering | Dr. Kincey |
| X. | Tenure (p. 100) | Dr. Watson |

FLORIDA A&M UNIVERSITY
Board of Trustees

## INFORMATION ITEMS

XI. Student Affairs Update (p. 104) — Dr. William Hudson, Jr.
- Enrollment Management
- Financial Aid

XII. Academic Affairs Update (p. 105) — Dr. Watson
- Academic Program Prioritization Update (p. 106)
- College of Law (p. 109)
- FAMU DRS Update (p. 126)
- Post-Tenure Review

XIII. Adjournment

FLORIDA A&M UNIVERSITY

**Board of Trustees**
**ACTION ITEM**

## Academic and Student Affairs Committee

**Monday, May 20, 2024**
**Agenda Item: III**

**Subject:** Minutes for March 6, 2024 Meeting

**Proposed Board Action:** In accordance with the Florida Statutes, a governmental body shall prepare and keep minutes or make a tape recording of each open meeting of the body.

**Attachment(s):** Yes

1. Minutes for March 6, 2024

FLORIDA A&M UNIVERSITY
**Board of Trustees**

# Academic and Student Affairs Committee Minutes
## Trustee Nicole Washington, Chair
## March 6, 2024

Trustee Nicole Washington called the meeting to order. Ms. Valeria Singleton called the roll, and the following committee members were present: Jamal Brown, Otis Cliatt, Deveron Gibbons, Kristin Harper, Londe Mondelus, and Nicole Washington. A quorum was established.

Trustee Gibbons moved to approve the minutes for the meeting on December 6, 2023. Trustee Brown seconded the motion, and the motion carried.

The Committee recommended approval of the following items:

**Sabbatical and Professional Development Leave -** Each year, the University allows faculty to apply for sabbatical or professional development leave for the succeeding year. This year, seven faculty members were approved for sabbatical leave, and two staff members were approved for professional development leave.

| Name | College/School | Semester(s) |
|---|---|---|
| Dr. Ashvini Chauhan | School of the Environment | Fall 2024 |
| Dr. Beni Dangi | College of Science and Technology | Fall 2024 and Spring 2025 |
| Dr. Sungmoon Jung | FAMU-FSU College of Engineering | Spring 2025 |
| Dr. Bhanu Prasad | College of Science and Technology | Fall 2024 |
| Dr. Gwendolyn Singleton | College of Social Sciences, Arts, and Humanities | Fall 2024 |
| Dr. Komalavalli Thirunavukkuarasu | College of Science and Technology | Fall 2024 and Spring 2025 |
| Dr. Darius Young | College of Social Sciences, Arts, and Humanities | Spring 2025 |
| **Name** | **Area** | **Semester(s)** |
| Dr. Elizabeth Dawson | Carrie Meek-James N. Eaton Black Archives Research and Museum | Spring 2025 |
| Professor Kenneth Jones | School of Journalism & Graphic Communications | Spring 2025 |

Trustee Brown moved to approve the applications for sabbatical and professional development leave. Trustee Mondelus seconded the motion, and the motion carried.

**Student Affairs Updates** – informational updates were provided:

- Dr. William Hudson, Jr., and his team provided updates on enrollment management, financial aid, and hazing prevention.
- The Office of Undergraduate Admissions and Recruitment continues to experience increases in first-time-in-college (FTIC) applications with a 2.6% increase.
    - Transfer applications from the Florida College System (FCS) are down. However, we actively engage FCS collaborations to encourage enrollment and update academic pathways. Currently, 1,267 transfer students are enrolled in the IGNITE program through FCS partners.
    - The recruitment team participated in the Los Angeles HBCU Expo in early February, with more than 20,000 student participants.
- The Spring Preview and Be Out Day will be on Saturday, March 23, 2024. There are approximately 5,233 total participants registered for the Spring Preview.
- The Office of Financial Aid continues to monitor the Department of Education's (DOE) website for updates regarding the FAFSA simplification. The DOE has released information sparingly over the past few months, leaving schools and service providers in limbo regarding preparation for receiving and reviewing student records.
- The US Department of Education has been working to simplify financial aid forms for several years. The process was to go live on December 31, 2023, but it has been dramatically delayed. So, the University is creating an internal FAFSA simplification webpage and communication plan for internal and external stakeholders, and it will debut within a few days. We will utilize Trellis to assist with disseminating information to students through emails, text messages, informational videos, workshops, town halls, and social media.
- The transfer of applicant information to schools, state higher-education agencies, and scholarship organizations has hindered the financial aid offices' ability to process, package, and communicate financial aid offers to students.

**Question:** What's the timeline for awarding financial aid with the FAFSA simplification process?

**Response:** There was a soft launch in December 2023; however, there were timeline restrictions. Applications could be submitted between 8 a.m. and 8 p.m. daily. If students or parents need to make corrections, they can no longer make the corrections because the portal is closed. The University has not received any FAFSA applications for the 2024 – 2025 award year, so this puts the University at the mercy of the Department of Education.

**Question:** Previously, what percentage of our students would have been awarded by now?

**Response:** As of today, all of our incoming students would have been awarded aid, and we would have received at least 75% of our FAFSA applications from the Department of Education.

**Question:** What is the typical timeframe for packaging the awards?

**Response:** Normally, we package the freshmen awards in March, and continuing students' awards are packaged in April. The delay with the FAFSA application delivery has caused uncertainty about when we will be able to package the awards. This will have a substantial potential financial impact on the school.

**Question:** Is this unique to FAMU?

**Response:** No, this is not unique to FAMU. It has impacted all institutions that participate in federal aid. The financial implications for FAMU are $150 million. This is a serious matter because it interferes with the timing of the packaging of financial assistance and affects housing and meal plans.

- The final informational update was regarding the hazing prevention initiatives:
  - The University has one open investigation of a possible violation of University Regulation 2.028.
  - There are 22 Greek letter organizations and clubs are holding membership intake this semester. Hazing prevention educational sessions will be conducted with these entities upon completing their membership intake processes.

**Academic Affairs Updates** – The following informational updates were provided:

- Provost Watson provided brief updates on retention and academic excellence, the Rattler Solar Center, and the inaugural Provost Professor for Community Engagement, Outreach, and Research.

  - **Retention** – Our increasing retention of first-time college students has come to fruition based on the diligent work of Student Success, the Office of First Year Experience, and the Academic Advising teams. There are currently 21 advisors employed with an average advising load of 250. Four vacancies will be filled, and 11 positions will be advertised this month. When filled, all units will be staffed entirely, including academic units, the Center for Educational Disability Access and Resources, and Transfer Student Success. There was a special athletic advising session where the advisors provided one-to-one advising to athletes. The registration portal for the fall semester will open on March 25. The Academic Advising Office will host an Advising Blitz on March 20 to promote early registration.

  - **Academic Excellence -** Dr. Darius Young, a history professor, was selected for the American Council of Learned Societies (ACLS) as an inaugural ACLS HBCU Faculty Fellow and Grantee. Dr. Young was selected from a pool of more than 150 applications; the 2024 ACLS HBCU Faculty Fellows and Grantees represent 16 HBCUs and a wide range of disciplines

and scholarly approaches to humanistic research, community-engaged work, and pedagogical innovation.

As a fellow, Dr. Young will receive up to $50,000 to support long-term engagement with a significant research project. Additionally, as an awardee, our institution will receive an additional grant of $2,500 to support humanities programming and infrastructure.

- **Rattler Solar Center -** The College of Agriculture and Food Sciences acquired funding from Duke Energy to establish the Rattler Solar Center in Hernando County. This project marks a significant stride towards sustainability and innovation within our university community.

  The Rattler Solar Center is named in recognition of our partnership with Duke Energy and its strategic location. The center will testify to our commitment to renewable energy and environmental stewardship. Utilizing photovoltaic (PV) panels, the facility is poised to produce enough electricity to power approximately 23,000 average-sized homes at peak production. The new Rattler Solar Center will span 560 acres within a 2,100-acre parcel. With a capacity of 74.9 megawatts, it will house approximately 210,000 solar panels, embodying a substantial leap towards clean energy production.

  This endeavor exemplifies the intersection of academia, industry, and community engagement. Through our partnership with Duke Energy and the diligent efforts of our faculty and staff, the Rattler Solar Center will serve as a beacon of sustainability and innovation, leaving a lasting impact on generations to come.

- **Provost Professor for Community Engagement, Outreach, and Research –** Regarding the triad to reach Carnegie R1 Status of Research, Teaching, and Service, the Office of Academic Affairs has secured two inaugural Provost Professor for Community Engagement, Outreach, and Research.
  - Dr. Reginald Ellis, Associate Professor of History, and Dr. Gail Randolph, Associate Professor of Physical Therapy, are the two esteemed members who launched the initiative. In this role, the two will assist with the cultivation, development, implementation, evaluation, and dissemination of evidence-based and successful strategies to address essential needs of the local and regional community, specifically as it relates to the Boldly Striking 2022-2027 strategic plan. They will develop and sustain productive working relationships with local and regional partners and collaborate with other university-wide academic teams to document the relevance and impact of partnership programs. We look forward to growing this initiative to bring university impact across the colleges and schools and into the universities.

Lastly, Provost Allyson Watson and Dean Sarah Price (College of Education) secured 9 million dollars of a 50-million-dollar Unlimited Potential Partnership School Grant from the US Department of Education. The University of Central Florida leads this grant and will have a 5-year sustainable impact across Florida. The grant will directly impact Unlimited Potential Schools for the Northern Florida Region through FAMU Developmental Research School and Leon County public schools.

Dr. Jennifer Collins provided an update on the academic planning tool that empowers students to navigate their degree programs—EduNav. The tool will act as a GPS for the students and help them navigate their pathway to graduation.

There being no further discussion, the meeting was adjourned at 2:32 p.m.

Respectfully submitted,

Nicole Washington, Committee Chair

FLORIDA A&M UNIVERSITY

**Board of Trustees**

## Academic and Student Affairs Committee

**Monday, May 20, 2024**

**Agenda Item: IV**

**Subject:** Follow-Up Item(s)

**Background Information and Summary:** An update on follow-up items from March meeting.

FLORIDA A&M UNIVERSITY

**Board of Trustees**
**ACTION ITEM**

## Academic and Student Affairs Committee

**Monday, May 20, 2024**
**Agenda Item: V**

**Subject:** Request for Leave of Absence

**Proposed Board Action:** It is recommended that the Board of Trustees approve the Request for Leave of Absence for Dr. Elise Simmons.

| Employee's Name | Dates of Leave | Reason |
|---|---|---|
| Elise Simmons | 8/12/2024 – 5/9/2025 | Personal |

**Attachment:** No

FLORIDA A&M UNIVERSITY

**Board of Trustees**
**ACTION ITEM**

## Academic and Student Affairs Committee

**Monday, May 20, 2024**
**Agenda Item: VI**

**Subject:** BOT Regulation 4.008 – Religious Holidays

**Proposed Board Action:** This Regulation outlines the process for accommodating religious observances.

The University is requesting that the Board of Trustees approve Regulation 4.008 for notice and adoption in accordance with the Florida Board of Governors' Regulation Development Procedure.

**Attachment:** Yes

1. Regulation 4.008 – Religious Holidays

**FLORIDA A&M UNIVERSITY BOARD OF TRUSTEES**

**NOTICE OF PROPOSED NEW REGULATION**

**DATE:** March 19, 2024

**REGULATION CHAPTER NO.:** Chapter 4

**REGULATION CHAPTER TITLE:** Academic Affairs

**REGULATION TITLE AND NO:** Religious Holidays 4.008

**SUMMARY OF REGULATION**: The purpose of this Regulation is to outline the process for accommodating religious observances.

**AUTHORITY FOR REGULATION**: Article IX, Section 7(c), Florida Constitution, Board of Governors Regulation Development Procedure dated July 21, 2005, Board of Governors Regulation 1.001; 6.0115.

**UNIVERSITY OFFICIAL INITIATING THIS REGULATION**: Nigel D. Edwards, Ed.D., Associate Vice President for Student Affairs/Administration and Assessment.

**PROCEDURE FOR COMMENTS**: Written comments concerning this proposed regulation shall be submitted within 14 days of the date of this notice to the person identified below. The comments must specifically identify the regulation you are commenting on.

**THE PERSON TO BE CONTACTED REGARDING THE PROPOSED REGULATION IS:** Allyson Watson, Ph.D., Provost and Vice President for Academic Affairs, 1601 S. Martin Luther King Jr. Blvd., 300 Lee Hall, Tallahassee, Florida 32307, (850) 599-3276 (Telephone), allyson.watson@famu.edu.

**FULL TEXT OF THE PROPOSED REGULATION**: The full text of this amended Regulation follows:

Florida A&M University Regulation

## 4.008 Religious Holidays

(1) **Policy Purpose and Intent -** The purpose of this Regulation is to outline the process for accommodating religious observances.

(2) **Statement of Policy –** Pursuant to Board of Governors Regulation 6.0115, all University students shall be allowed to observe holy days of their religious faith. The University shall reasonably accommodate the religious observance, practice and belief of individual students regarding admissions, class attendance, and the scheduling of examinations and work assignments.

Accordingly, the University requires:

(a) A student who wishes to observe a religious holy day of their religious faith shall notify, in writing, all of their instructors and the appropriate academic dean, in order to be excused from class to observe the religious holy day. This written notice should be provided at the beginning of each semester, but no later than 10 days prior to the observed religious holy day.

(b) The student shall be held responsible for any material covered during the excused absence, but shall be permitted a reasonable amount of time to make up any work missed.

(c) Students who are absent from academic or social activities because of religious observances shall not be penalized by their instructors and/or university administrators.

(d) Any student who feels that they have been unreasonably denied educational benefits because of their religious belief or practice may informally seek redress by presenting, in writing, the nature of their grievance to the Provost and Vice President for Academic Affairs or the Vice President for Student Affairs who will investigate and document each occurrence (grievance) and ensure that appropriate corrective action is taken to assure compliance with this policy.

(e) If the matter is not resolved satisfactorily by the Provost and Vice President for Academic Affairs or the Vice President for Student Affairs, the student may file a complaint pursuant to University Regulation 10.103, with the Office of Equal Opportunity Programs.

(f) This Regulation shall be included in the student handbook, and/or other similar documents regularly provided to the faculty and students.

*Specific Authority: Article IX, Fla. Const., 1006.53, Florida Statutes; BOG Regulation 1.001 and 6.0115; History-New XX-XX-XX.*

FLORIDA A&M UNIVERSITY

**Board of Trustees**
**ACTION ITEM**

Academic and Student Affairs Committee
Monday, May 20, 2024
Agenda Item: VII

**Subject**: Review of General Education Course Offerings

**Rationale:** The Office of the Provost, in conjunction with academic unit administrators, faculty, and institutional partners in the Registrar's Office, General Education Assessment Committee, and University Curriculum Committee has reviewed FAMU's general education course offerings to ensure compliance with the content, principles, and standards required for general education courses in the state of Florida in accordance with statutory and regulatory requirements. Upon approval by the Board of Trustees, FAMU's list of general education course offerings will be submitted to the Board of Governors by the required deadline of September 1st.

**Proposed Board Action**: Approve FAMU's General Education Course Offerings

**Attachments**: List of Active General Education Courses

**Florida A University**
**2024 General Education Course Offerings Report**

| Institution | Prefix | Level | Course Number | Lab | Course Title | Date of Last Update | Credit | General Ed Core | General Ed Requirements | Course Review Status | General Education Updates | Additional Updates | Total # Institutions Offering Course | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLORIDA A & M UNIVERSITY | MAC | 2 | 311 | | CALCULUS I | 08/01/2015 | 4 | Math | Math | Reviewed: Updated | | Course Description | 42 | |
| FLORIDA A & M UNIVERSITY | REL | 2 | 320 | | WESTERN WORLD RELIGIONS | 08/30/1997 | 3.0 | | Humanities | Reviewed: Updated | General Education (Institution) | Other Changes | 1 | Course number was updated to 2302 |
| FLORIDA A & M UNIVERSITY | MAD | 2 | 120 | | FINITE MATHEMATICS | 08/01/1999 | 3.0 | | Math | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | MGF | 1 | 106 | | LIBERAL ARTS MATH I | 08/01/2015 | 3 | Math | Math | Reviewed: Updated | General Education (Institution) | | 42 | Removed from Gen Ed Core for new students entering Fall 2024 but kept as Gen Ed Institution for existing students |
| FLORIDA A & M UNIVERSITY | BSC | 1 | 011 | | GENERAL BIOLOGY II | 05/01/1997 | 2.0 | | Natural Science | Reviewed: No Updates | | | 17 | |
| FLORIDA A & M UNIVERSITY | PHH | 2 | 102 | | ANCIENT AND MEDIEVAL PHILOSOPHY | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | MAC | 1 | 133 | | COLLEGE ALGEBRA AND TRIGONOMETRY | 08/01/1986 | 3.0 | | Math | Reviewed: Removed from General Education | General Education (Institution) | Not Applicable | 1 | Course removed from Gen Ed Institutional |
| FLORIDA A & M UNIVERSITY | PHI | 2 | 101 | | INTRODUCTION TO LOGIC | 08/30/1997 | 3.0 | | Humanities | Reviewed: No Updates | | | 2 | |
| FLORIDA A & M UNIVERSITY | REL | 2 | 240 | | INTRODUCTION TO THE NEW TESTAMENT | 08/01/2012 | 3.0 | | Humanities | Reviewed: No Updates | | | 7 | |
| FLORIDA A & M UNIVERSITY | BSC | 1 | 010 | | GENERAL BIOLOGY I | 08/01/2015 | 3 | Natural Science | Natural Science | Reviewed: Updated | | Course Description | 24 | |
| FLORIDA A & M UNIVERSITY | PSC | 1 | 121 | C | INTRODUCTION TO PHYSICAL SCIENCE | 08/01/2000 | 4.0 | | Natural Science | Reviewed: No Updates | | | 4 | |
| FLORIDA A & M UNIVERSITY | STA | 2 | 023 | | INTROD. TO PROBABILITY AND STATISTICS I | 08/01/2015 | 3 | Math | Math | Reviewed: Updated | | Course Description | 29 | |
| FLORIDA A & M UNIVERSITY | BSC | 2 | 093 | | ANATOMY AND PHYSIOLOGY I | 03/15/2023 | 3.0 | | Natural Science | Reviewed: Removed from General Education | | | 6 | Course has been discontinued as 03/15/2023 |
| FLORIDA A & M UNIVERSITY | BSC | 1 | 005 | | BIOLOGICAL SCIENCE | 08/01/2015 | 3 | Natural Science | Natural Science | Reviewed: Updated | | Course Description | 41 | |
| FLORIDA A & M UNIVERSITY | BSC | 2 | 094 | | ANATOMY & PHYSIOLOGY II | 05/02/2022 | 3.0 | | Natural Science | Reviewed: Removed from General Education | | | 4 | Course has been discontinued as of 01/01/2023 |
| FLORIDA A & M UNIVERSITY | THE | 2 | 300 | | CRITICAL ANALYSIS OF DRAMA | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 7 | |
| FLORIDA A & M UNIVERSITY | PHY | 2 | 049 | L | GENERAL PHYSICS II--LABORATORY | 01/01/2011 | 1.0 | | Natural Science | Reviewed: No Updates | | | 15 | |
| FLORIDA A & M UNIVERSITY | MAC | 2 | 233 | | CALCULUS FOR BUSINESS & SOCIAL SCIENCE I | 08/30/1997 | 3.0 | | Math | Reviewed: No Updates | | | 37 | |
| FLORIDA A & M UNIVERSITY | BSC | 2 | 093 | L | ANATOMY AND PHYSIOLOGY LAB | 08/01/2015 | 1.0 | | Natural Science | Reviewed: Removed from General Education | | | 2 | Course has been discontinued 01/01/2023 |
| FLORIDA A & M UNIVERSITY | AML | 2 | 010 | | AMERICAN LITERATURE I | 08/30/1997 | 3.0 | | Humanities | Reviewed: No Updates | | | 18 | |
| FLORIDA A & M UNIVERSITY | PHY | 2 | 053 | | COLLEGE PHYSICS I--LABORATORY | 08/01/2015 | 3 | Natural Science | | Reviewed: Updated | General Education (Institution) | Course Description | 21 | Course Title Changed to College Physics I |
| FLORIDA A & M UNIVERSITY | PHY | 2 | 054 | L | COLLEGE PHYSICS II--LABORATORY | 01/01/2016 | 0.0 | | Natural Science | Reviewed: No Updates | | | 8 | |
| FLORIDA A & M UNIVERSITY | PHY | 2 | 048 | L | GENERAL PHYSICS I--LABORATORY | 05/02/2022 | 1.0 | | Natural Science | Reviewed: No Updates | | | 19 | |
| FLORIDA A & M UNIVERSITY | REL | 2 | 210 | | INTRODUCTION TO THE OLD TESTAMENT | 08/01/2012 | 3.0 | | Humanities | Reviewed: No Updates | | | 8 | |
| FLORIDA A & M UNIVERSITY | MAC | 2 | 312 | | CALCULUS II | 08/30/1997 | 4.0 | | Math | Reviewed: No Updates | | | 39 | |
| FLORIDA A & M UNIVERSITY | CHM | 1 | 015 | | FUNDAMENTALS OF CHEMISTRY | 10/03/1990 | 3.0 | | Natural Science | Reviewed: Updated | Both General Education (Core/Institution) | Course Description and Discipline/Subject Area | 2 | CHM 1015 is now CHM 1020 |
| FLORIDA A & M UNIVERSITY | PHY | 2 | 049 | | GENERAL PHYSICS II | 01/01/2011 | 4.0 | | Natural Science | Reviewed: No Updates | | | 16 | |
| FLORIDA A & M UNIVERSITY | REL | 3 | 310 | | EASTERN WORLD RELIGIONS | 08/01/2017 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | GEA | 2 | 000 | | WORLD REGIONAL GEOGRAPHY | 08/30/1997 | 3.0 | | Social Sciences | Reviewed: No Updates | | | 13 | |
| FLORIDA A & M UNIVERSITY | BOT | 1 | 010 | | ELEMENTARY BOTANY | 08/01/2015 | 3.0 | | Natural Science | Reviewed: No Updates | | | 8 | |
| FLORIDA A & M UNIVERSITY | BSC | 2 | 094 | L | ANATOMY AND PHYSIOLOGY LAB | 08/01/2015 | 1.0 | | Natural Science | Reviewed: Removed from General Education | | | 4 | Course has been discontinued as of 01/01/2023 |
| FLORIDA A & M UNIVERSITY | PHY | 2 | 048 | | GENERAL PHYSICS I | 08/01/2015 | 4 | Natural Science | Natural Science | Reviewed: Updated | | Course Description | 26 | |
| FLORIDA A & M UNIVERSITY | BSC | 1 | 010 | L | GENERAL BIOLOGY I LAB | 05/02/2022 | 1.0 | | Natural Science | Reviewed: No Updates | | | 19 | |
| FLORIDA A & M UNIVERSITY | REL | 2 | 135 | | BLACK RELIGION IN AMERICA | 01/01/2009 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | PHH | 3 | 400 | | MODERN PHILOSOPHY | 09/14/1989 | 3.0 | | Humanities | Reviewed: No Updates | | | 3 | |
| FLORIDA A & M UNIVERSITY | PHI | 2 | 010 | | INTRODUCTION TO PHILOSOPHY | 08/01/2015 | 3 | Humanities | Humanities | Reviewed: Updated | | Course Description | 37 | |
| FLORIDA A & M UNIVERSITY | MUH | 3 | 212 | | HISTORY AND LITERATURE OF MUSIC II | 08/01/1983 | 3.0 | | Humanities | Reviewed: Updated | General Education (Institution) | Course Description | 3 | |
| FLORIDA A & M UNIVERSITY | REL | 3 | 383 | | CARIBBEAN RELIGION & CULTURE | 08/01/2012 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | PSY | 2 | 012 | | INTRO TO PSYCHOLOGY | 08/01/2015 | 3 | Social Sciences | Social Sciences | Reviewed: Updated | | Course Description | 47 | |
| FLORIDA A & M UNIVERSITY | WOH | 1 | 022 | | HISTORY OF CIVILIZATION SINCE 1500 | 07/11/1994 | 3.0 | | Humanities | Reviewed: No Updates | | | 14 | |
| FLORIDA A & M UNIVERSITY | ARH | 2 | 051 | | ART HISTORY II: BAROQUE TO MODERN | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 29 | |
| FLORIDA A & M UNIVERSITY | THE | 3 | 112 | | THEATRE HISTORY I | 08/01/1996 | 3.0 | | Humanities | Reviewed: Updated | General Education (Institution) | Course Description | 1 | |
| FLORIDA A & M UNIVERSITY | HUM | 3 | 244 | | 19TH CENTURY REVOLUTIONS: HISTORIC AND ARTISTIC | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | POS | 2 | 041 | | AMERICAN NATIONAL GOVERNMENT | 08/01/2015 | 3 | Social Sciences | Social Sciences | Reviewed: Updated | | Course Description | 37 | |
| FLORIDA A & M UNIVERSITY | ENC | 1 | 121 | | HONORS FRESHMAN COMPOSITION I | 08/23/1989 | 3.0 | | Communications | Reviewed: No Updates | | | 7 | |
| FLORIDA A & M UNIVERSITY | POS | 2 | 112 | | AMERICAN STATE AND LOCAL GOVERNMENTS | 08/01/1996 | 3.0 | | Social Sciences | Reviewed: No Updates | | | 20 | |
| FLORIDA A & M UNIVERSITY | ENL | 3 | 013 | | ENGLISH LITERATURE TO THE 18TH CENTURY | 01/09/1986 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | ARH | 2 | 050 | | ART HISTORY I: PREHIST. THROUGH RENAISS. | 08/01/1978 | 3.0 | | Humanities | Reviewed: No Updates | | | 30 | |
| FLORIDA A & M UNIVERSITY | CHM | 1 | 045 | | GENERAL CHEMISTRY I | 08/01/2015 | 3 | Natural Science | Natural Science | Reviewed: Updated | | Course Description | 25 | |
| FLORIDA A & M UNIVERSITY | ARH | 2 | 000 | | ART APPRECIATION | 08/01/2015 | 3 | Humanities | Humanities | Reviewed: Updated | | Course Description | 24 | |
| FLORIDA A & M UNIVERSITY | MUL | 2 | 111 | | INTRODUCTION TO MUSIC I | 08/01/2011 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | HUM | 3 | 214 | | EARLY CIVILIZATIONS AND THE CLASSICAL WORLD | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | AEB | 2 | 104 | | ECONOMICS OF AGRICULTURE | 05/02/2022 | 3.0 | | Social Sciences | Reviewed: No Updates | | | 2 | |
| FLORIDA A & M UNIVERSITY | HUM | 3 | 237 | | COUNTER REFORMATION BAROQUE AND ENLIGHTENMENT | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |

**Florida A University**
**2024 General Education Course Offerings Report**

| Institution | Prefix | Level | Course Number | Lab | Course Title | Date of Last Update | Credit | General Ed Core | General Ed Requirements | Course Review Status | General Education Updates | Additional Updates | Total # Institutions Offering Course | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLORIDA A & M UNIVERSITY | BOT | 1 | 010 | L | ELEMENTARY BOTANY LAB | 08/01/2015 | 1.0 | | Natural Science | Reviewed: No Updates | | | 5 | |
| FLORIDA A & M UNIVERSITY | HUM | 3 | 217 | | JUDEO-CHRISTIAN AND MEDIEVAL CULTURES | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | THE | 3 | 113 | | THEATRE HISTORY II | 08/01/1996 | 3.0 | | Humanities | Reviewed: Updated | General Education (Institution) | Course Description | 1 | |
| FLORIDA A & M UNIVERSITY | MUH | 3 | 211 | | HISTORY AND LITERATURE OF MUSIC I | 08/01/1983 | 3.0 | | Humanities | Reviewed: Updated | General Education (Institution) | Course Description | 3 | |
| FLORIDA A & M UNIVERSITY | THE | 2 | 000 | | INTRODUCTION TO THEATRE | 08/01/2015 | 3 | Humanities | Humanities | Reviewed: Updated | | Course Description | 25 | |
| FLORIDA A & M UNIVERSITY | HUM | 2 | 230 | | HISTORICAL SURVEY II | 12/11/1990 | 3.0 | | Humanities | Reviewed: No Updates | | | 21 | |
| FLORIDA A & M UNIVERSITY | CHM | 1 | 045 | L | GENERAL CHEMISTRY I LABORATORY | 05/02/2022 | 1.0 | | Natural Science | Reviewed: No Updates | | | 18 | |
| FLORIDA A & M UNIVERSITY | ANT | 3 | 520 | | FORENSIC ANTHROPOLOGY | 08/01/2000 | 3.0 | | Social Sciences | Reviewed: Removed from General Education | Both General Education (Core/Institution) | | 1 | Discontinued 2009 |
| FLORIDA A & M UNIVERSITY | AMH | 2 | 010 | | U.S. HISTORY: 1492-1865 | 08/01/2015 | 3.0 | | Social Sciences | Reviewed: Updated | | Course Description | 35 | |
| FLORIDA A & M UNIVERSITY | AMH | 3 | 571 | | AFRO-AMERICAN HISTORY TO 1865 | 05/01/2017 | 3.0 | | Social Sciences | Reviewed: No Updates | | | 2 | |
| FLORIDA A & M UNIVERSITY | MMC | 2 | 000 | | INTRODUCTION TO MASS MEDIA | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 3 | |
| FLORIDA A & M UNIVERSITY | ECO | 2 | 013 | | PRINCIPLES OF ECONOMICS I | 08/01/2015 | 3 | Social Sciences | Social Sciences | Reviewed: Updated | | Course Description | 47 | |
| FLORIDA A & M UNIVERSITY | THE | 3 | 232 | | BLACK THEATRE/FILM AND RELIGIOUS STUDIES | 08/01/2000 | 3.0 | | Humanities | Reviewed: Updated | General Education (Institution) | Course Description | 1 | |
| FLORIDA A & M UNIVERSITY | LIT | 2 | 120 | | INTRODUCTION TO LITERATURE II | 07/28/1986 | 3.0 | | Humanities | Reviewed: No Updates | | | 27 | |
| FLORIDA A & M UNIVERSITY | MTG | 2 | 206 | | COLLEGE GEOMETRY | 08/01/2001 | 3.0 | | Math | Reviewed: No Updates | | | 5 | |
| FLORIDA A & M UNIVERSITY | AFA | 3 | 104 | | THE AFRICAN AMERICAN EXPERIENCE | 05/02/2022 | 3.0 | | Social Sciences | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | HUN | 2 | 401 | | NUTRITION | 08/01/2015 | 3.0 | | Natural Science | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | PHI | 2 | 801 | | INTRODUCTION TO AESTHETICS | 01/01/2000 | 3.0 | | Humanities | Reviewed: No Updates | | | 2 | |
| FLORIDA A & M UNIVERSITY | AMH | 2 | 091 | | INTRODUCTION TO AFRICAN AMERICAN HISTORY | 01/01/1991 | 3.0 | | Social Sciences | Reviewed: No Updates | | | 14 | |
| FLORIDA A & M UNIVERSITY | PHI | 3 | 601 | | ETHICS | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 2 | |
| FLORIDA A & M UNIVERSITY | CHM | 1 | 030 | L | INTRO CHEMISTRY FOR NON-SCIENCE MAJ LAB | 08/01/1996 | 1.0 | | Natural Science | Reviewed: No Updates | | | 2 | |
| FLORIDA A & M UNIVERSITY | EUH | 3 | 501 | | HISTORY OF ENGLAND, 1485 - 1714 | 08/10/1983 | 3.0 | | Humanities | Reviewed: No Updates | | | 2 | |
| FLORIDA A & M UNIVERSITY | MUH | 3 | 116 | | JAZZ HISTORY | 08/01/1996 | 3.0 | | Humanities | Reviewed: Updated | General Education (Institution) | Course Description | 1 | |
| FLORIDA A & M UNIVERSITY | ISC | 1 | 006 | C | WIDE WORLD OF SCIENCE I | 08/01/1998 | 4.0 | | Natural Science | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | SYG | 2 | 000 | | INTRODUCTION TO SOCIOLOGY | 08/01/2015 | 3 | Social Sciences | Social Sciences | Reviewed: Updated | General Education (Institution) | Course Description | 42 | Removed from State Gen Ed Core for new students entering Fall 2024 but kept as Gen Ed Institution for existing students. |
| FLORIDA A & M UNIVERSITY | MUH | 3 | 561 | | AFRO-AMERICAN MUSIC | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | AST | 1 | 002 | | ASTRONOMY | 08/01/2015 | 4 | Natural Science | Natural Science | Reviewed: Updated | | Course Description | 32 | |
| FLORIDA A & M UNIVERSITY | POS | 2 | 001 | | INTRODUCTION TO POLITICAL SCIENCE | 08/01/1996 | 3.0 | | Social Sciences | Reviewed: No Updates | | | 4 | |
| FLORIDA A & M UNIVERSITY | CHM | 1 | 046 | L | GENERAL CHEMISTRY II LABORATORY | 09/01/1987 | 1.0 | | Natural Science | Reviewed: No Updates | | | 16 | |
| FLORIDA A & M UNIVERSITY | MUL | 2 | 112 | | INTRODUCTION TO MUSIC II | 08/01/2011 | 2.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | ARH | 3 | 610 | | AMERICAN ART | 08/01/1983 | 3.0 | | Humanities | Reviewed: No Updates | | | 2 | |
| FLORIDA A & M UNIVERSITY | MAC | 1 | 147 | | PRECALCULUS MATHEMATICS | 01/06/1999 | 4.0 | | Math | Reviewed: No Updates | | | 30 | |
| FLORIDA A & M UNIVERSITY | EUH | 3 | 100 | | ANCIENT HISTORY | 05/31/1983 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | PHM | 3 | 120 | | CONTEMPORARY BLACK SOCIAL PHILOSOPHY | 08/01/1990 | 3.0 | | Humanities | Reviewed: Updated | General Education (Institution) | Course Description | 1 | |
| FLORIDA A & M UNIVERSITY | MAC | 1 | 105 | | COLLEGE ALGEBRA | 08/01/2015 | 3 | Math | Math | Reviewed: Updated | | Course Description | 59 | |
| FLORIDA A & M UNIVERSITY | BSC | 1 | 005 | L | BIOLOGICAL SCIENCE LAB | 05/02/2022 | 1.0 | | Natural Science | Reviewed: No Updates | | | 20 | |
| FLORIDA A & M UNIVERSITY | ANT | 2 | 000 | | INTRODUCTION TO ANTHROPOLOGY | 08/01/2015 | 3 | Social Sciences | Social Sciences | Reviewed: Updated | | Course Description | 26 | |
| FLORIDA A & M UNIVERSITY | ENC | 1 | 122 | | HONORS FRESHMAN COMPOSITION II | 08/23/1989 | 3.0 | | Communications | Reviewed: Updated | | | 7 | |
| FLORIDA A & M UNIVERSITY | GLY | 2 | 001 | | INTRO TO EARTH & SPACE SCIENCES | 05/02/2022 | 3.0 | | Natural Science | Reviewed: Updated | General Education (Core) | Course Description | 2 | |
| FLORIDA A & M UNIVERSITY | CHM | 1 | 030 | | INTRO CHEMISTRY FOR NON-SCIENCE MAJORS | 08/01/1996 | 3.0 | | Natural Science | Reviewed: No Updates | | | 7 | |
| FLORIDA A & M UNIVERSITY | HUM | 3 | 546 | | CARIBBEAN LITERATURE AND POPULAR CULTURE | 05/02/2022 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | HUM | 3 | 930 | | SPECIAL TOPICS IN THE HUMANITIES | 08/01/2015 | 3.0 | | Humanities | Reviewed: Updated | | | 8 | |
| FLORIDA A & M UNIVERSITY | EUH | 3 | 120 | | MEDIEVAL HISTORY | 05/31/1983 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | ENL | 3 | 034 | | ENGLISH LITERATURE II | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | HUM | 3 | 238 | | THE EUROPEAN RENAISSANCE AND REFORMATION | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | REL | 2 | 000 | | INTRODUCTION TO RELIGION | 08/01/2012 | 3.0 | | Humanities | Reviewed: No Updates | | | 14 | |
| FLORIDA A & M UNIVERSITY | LIT | 3 | 196 | | AFRICAN-CARIBBEAN LITERATURE | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | LIT | 3 | 824 | | LATINO/A LITERATURE | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | AMH | 2 | 020 | | U.S. HISTORY 1865 TO PRESENT | 07/01/2015 | 3 | Social Sciences | Social Sciences | Reviewed: Updated | | Course Description | 40 | |
| FLORIDA A & M UNIVERSITY | ENC | 1 | 102 | | FRESHMAN COMMUNICATION SKILLS II | 07/08/1986 | 3.0 | | Communications | Reviewed: No Updates | | | 60 | |
| FLORIDA A & M UNIVERSITY | MGF | 1 | 107 | | 930 | 08/01/2015 | 3 | Math | | Reviewed: Removed from General Education | General Education (Core) | | 41 | Removed from Gen Ed Core for new students entering Fall 2024 but kept as Gen Ed Institution for existing students |
| FLORIDA A & M UNIVERSITY | PHH | 3 | 600 | | CONTEMPORARY PHILOSOPHY | 09/14/1988 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | HUM | 2 | 211 | | HISTORICAL SURVEY I | 08/01/1990 | 3.0 | | Humanities | Reviewed: No Updates | | | 8 | |
| FLORIDA A & M UNIVERSITY | ENC | 1 | 101 | | FRESHMAN COMMUNICATION SKILLS I | 08/01/2015 | 3 | Communications | Communications | Reviewed: Updated | | Course Description | 68 | |
| FLORIDA A & M UNIVERSITY | REL | 3 | 130 | | RELIGION IN AMERICAN CULTURE | 08/01/2012 | 3.0 | | Humanities | Reviewed: No Updates | | | 2 | |
| FLORIDA A & M UNIVERSITY | BSC | 1 | 011 | L | GENERAL BIOLOGY LAB | 05/01/1997 | 2.0 | | Natural Science | Reviewed: No Updates | | | 11 | |
| FLORIDA A & M UNIVERSITY | AMH | 3 | 572 | | AFRO-AMERICAN HISTORY SINCE 1865 | 08/01/2017 | 3.0 | | Social Sciences | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | GLY | 2 | 010 | C | PRINCIPLES OF GEOLOGY | 04/01/2015 | 3.0 | | Natural Science | Reviewed: No Updates | | | 11 | |
| FLORIDA A & M UNIVERSITY | ECO | 2 | 023 | | PRINCIPLES OF ECONOMICS II | 09/01/1981 | 3.0 | | Social Sciences | Reviewed: No Updates | | | 30 | |
| FLORIDA A & M UNIVERSITY | ARC | 2 | 701 | | ARCHITECTURAL HISTORY 1 | 08/02/2023 | 3.0 | | Humanities | Reviewed: No Updates | | | 3 | |

**Florida A University**
**2024 General Education Course Offerings Report**

| Institution | Prefix | Level | Course Number | Lab | Course Title | Date of Last Update | Credit | General Ed Core | General Ed Requirements | Course Review Status | General Education Updates | Additional Updates | Total # Institutions Offering Course | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLORIDA A & M UNIVERSITY | CHM | 1 | 025 | | FUNDAMENTALS OF CHEMISTRY | 05/02/2022 | 4.0 | | Natural Science | Reviewed: Updated | Both General Education (Core/Institution) | Other Changes | 18 | Course number changed to CHM 1020. |
| FLORIDA A & M UNIVERSITY | HUM | 3 | 421 | | AFRICAN AMERICANS IN FILM | 05/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | HUM | 3 | 401 | | ASIAN HUMANITIES | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | THE | 3 | 235 | | CONTEMPORARY BLACK THEATRE | 12/11/1990 | 3.0 | | Humanities | Reviewed: Updated | General Education (Institution) | Course Description | 1 | |
| FLORIDA A & M UNIVERSITY | REL | 4 | 440 | | CONTEMPORARY RELIGIOUS THOUGHT | 08/01/1996 | 3.0 | | Humanities | Reviewed: Removed from General Education | | | 2 | Discontinued in 2003 (course number changed to REL 4420). |
| FLORIDA A & M UNIVERSITY | ISC | 1 | 007 | C | WIDE WORLD OF SCIENCE II | 08/01/1998 | 4.0 | | Natural Science | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | HUM | 3 | 425 | | AFRICAN HUMANITIES | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | REL | 3 | 145 | | WOMEN IN RELIGION | 08/01/2015 | 3.0 | | Humanities | Reviewed: Updated | | | 1 | |
| FLORIDA A & M UNIVERSITY | MAC | 1 | 114 | | ALGEBRAIC AND TRIGONOMETRIC FUNCTIONS | 08/15/1999 | 3.0 | | Math | Reviewed: No Updates | | | 38 | |
| FLORIDA A & M UNIVERSITY | HUM | 3 | 255 | | MODERN AND POST-MODERN CULTURE | 08/01/2015 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | LIT | 2 | 110 | | INTRODUCTION TO LITERATURE I | 03/15/2023 | 3.0 | | Humanities | Reviewed: Removed from General Education | | | 25 | Course has been discontinued as of 03/15/2023 (replaced with LIT 2000) |
| FLORIDA A & M UNIVERSITY | WOH | 1 | 012 | | HISTORY OF CIVILIZATION | 05/16/1983 | 3.0 | | Humanities | Reviewed: No Updates | | | 14 | |
| FLORIDA A & M UNIVERSITY | CHM | 1 | 046 | | GENERAL CHEMISTRY II | 09/01/1987 | 3.0 | | Natural Science | Reviewed: No Updates | | | 22 | |
| FLORIDA A & M UNIVERSITY | PSC | 1 | 121 | L | INTRO TO PHYSICAL SCIENCE LAB | 08/01/1996 | 0.0 | | Natural Science | Reviewed: Removed from General Education | | | 1 | Course discontinued as of 08/04/2000 |
| FLORIDA A & M UNIVERSITY | PHY | 2 | 005 | L | ELEMENTS OF PHYSICS II LAB | 08/30/1997 | 1.0 | | Natural Science | Reviewed: Removed from General Education | | | 2 | Course discontinued as of 08/04/2000 |
| FLORIDA A & M UNIVERSITY | PHY | 2 | 005 | | ELEMENTS OF PHYSICS-II | 08/30/1997 | 2.0 | | Natural Science | Reviewed: Removed from General Education | | | 2 | Course discontinued as of 08/04/2000 |
| FLORIDA A & M UNIVERSITY | PHY | 2 | 004 | | ELEMENTS OF PHYSICS | 08/30/1997 | 3.0 | | Natural Science | Reviewed: Removed from General Education | | | 3 | Course discontinued as of 08/04/2000 |
| FLORIDA A & M UNIVERSITY | REL | 2 | 302 | | WESTERN WORLD RELIGIONS | 08/01/2012 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | CHM | 1 | 020 | | FUNDAMENTALS OF CHEMISTRY | 08/01/2015 | 3 | Natural Science | Natural Science | Reviewed: No Updates | | Course Description | 35 | |
| FLORIDA A & M UNIVERSITY | AML | 3 | 041 | | AMERICAN LITERATURE II | 08/01/2005 | 3.0 | | Humanities | Reviewed: No Updates | | | 3 | |
| FLORIDA A & M UNIVERSITY | HUM | 2 | 210 | | HISTORICAL SURVEY I | 03/15/2023 | 3.0 | | Humanities | Reviewed: Removed from General Education | | | 21 | Discontinued as of 03/16/2023 (changed to HUM 2020 |
| FLORIDA A & M UNIVERSITY | MAS | 3 | 105 | | LINEAR ALGEBRA | 08/01/2006 | 3.00 | | Math | Reviewed: No Updates | | | 2 | |
| 930 | 930 | 1 | 001 | | FUNDAMENTALS OF ENVIRONMENTAL SCIENCE | 08/01/2015 | 3 | Natural Science | | Reviewed: Updated | Both General Education (Core/Institution) | Other Changes | 25 | Duplicate course |
| FLORIDA A & M UNIVERSITY | ESC | 2 | 000 | | INTRO TO EARTH & SPACE SCIENCES FOR PROSPECTIVE AN | 08/01/2015 | 3 | Natural Science | | Reviewed: Updated | Both General Education (Core/Institution) | Discipline/Subject Area | 6 | Added to General Ed Core/Institution |
| FLORIDA A & M UNIVERSITY | EVR | 1 | 001 | | FUNDAMENTALS OF ENVIRONMENTAL SCIENCE | 05/02/2022 | 3.0 | Natural Science | | Reviewed: Updated | | Course Description | 25 | Duplicate course (change from 1CH to 3CH) |
| FLORIDA A & M UNIVERSITY | QMB | 2 | 100 | | QUANTITATIVE METHODS & BUSINESS DECISIONS I | 08/01/2015 | 3.0 | | Math | Reviewed: No Updates | | | 2 | |
| FLORIDA A & M UNIVERSITY | REL | 3 | 375 | | CARIBBEAN RELIGION & CULTURE | 08/01/2017 | 3.0 | | Humanities | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | AFA | 2 | 000 | | INTRO TO AFRICAN AMERICAN STUDIES | 05/02/2022 | 3.0 | | Social Sciences | Reviewed: No Updates | | | 5 | |
| FLORIDA A & M UNIVERSITY | MUL | 2 | 010 | | MUSIC APPRECIATION | 05/02/2022 | 3 | Humanities | Humanities | Reviewed: Updated | | Course Description | 25 | |
| FLORIDA A & M UNIVERSITY | ENY | 2 | 001 | | INSECTS, PEOPLE AND ENVIRONMENT | 05/02/2022 | 3.0 | | Natural Science | Reviewed: No Updates | | | 1 | |
| FLORIDA A & M UNIVERSITY | AMH | 3 | 676 | | BLACK BEAUTY: WOMEN'S IMAGES AND NATIONAL IDENTITY | 08/01/2021 | 3.0 | | Social Sciences | Reviewed: Removed from General Education | | | 1 | |
| FLORIDA A & M UNIVERSITY | AFA | 3 | 371 | | THE EVOLUTION OF HIP HOP | 08/01/2021 | 3.0 | | Social Sciences | Reviewed: Removed from General Education | | | 1 | |
| FLORIDA A & M UNIVERSITY | POS | 3 | 037 | | ENVIRONMENTAL HISTORY AND POLITICAL ECOLOGY OF THE AFRICAN DIASPORA | 08/01/2021 | 3.0 | | Humanities ,Social Sciences | Reviewed: Removed from General Education | | | 1 | |
| FLORIDA A & M UNIVERSITY | AFA | 3 | 359 | | ENVIRONMENTAL HISTORY AND POLITICAL ECOLOGY OF THE AFRICAN DIASPORA | 08/01/2021 | 3.0 | | Humanities ,Social Sciences | Reviewed: Removed from General Education | | | 1 | |
| FLORIDA A & M UNIVERSITY | LIT | 2 | 000 | | INTRODUCTION TO LITERATURE I | 03/16/2023 | 3.0 | Humanities | Humanities | Reviewed: Updated | | Course Description | 30 | |
| FLORIDA A & M UNIVERSITY | BSC | 2 | 085 | | ANATOMY AND PHYSIOLOGY I | 03/16/2023 | 3.0 | Natural Science | Natural Science | Reviewed: Updated | | Course Description | 24 | |
| FLORIDA A & M UNIVERSITY | BSC | 2 | 085 | L | ANATOMY AND PHYSIOLOGY LAB | 01/01/2023 | 1.0 | | Natural Science | Reviewed: No Updates | | | 11 | |
| FLORIDA A & M UNIVERSITY | BSC | 2 | 086 | | ANATOMY & PHYSIOLOGY II | 01/01/2023 | 3.0 | | Natural Science | Reviewed: No Updates | | | 17 | |
| FLORIDA A & M UNIVERSITY | BSC | 2 | 086 | L | ANATOMY AND PHYSIOLOGY II LAB | 01/01/2023 | 1.0 | | Natural Science | Reviewed: No Updates | | | 9 | |
| FLORIDA A & M UNIVERSITY | HUM | 2 | 020 | | HISTORICAL SURVEY I | 03/16/2023 | 3.0 | Humanities | Humanities | Reviewed: Updated | | Course Description | 20 | |
| FLORIDA A & M UNIVERSITY | PHY | 2 | 053 | L | COLLEGE PHYSICS I--LABORATORY | 01/1/2022 | 1.0 | Natural Science | | Reviewed: Updated | Both General Education (Core/Institution) | Other Changes | 12 | Course reactivated in SCNS |
| FLORIDA A & M UNIVERSITY | PHY | 2 | 054 | | COLLEGE PHYSICS II | 01/1/2022 | 3.0 | | Natural Science | Reviewed: Updated | General Education (Institution) | Not Applicable | 10 | Course added to Gen Ed Institution. Lab is already on the list |
| FLORIDA A & M UNIVERSITY | ENY | 2 | 001 | L | INSECTS, PEOPLE AND ENVIRONMENT | 01/1/2018 | 1.0 | | Natural Science | Reviewed: Updated | General Education (Institution) | Other Changes | 1 | |
| FLORIDA A & M UNIVERSITY | OCE | 1 | 001 | | ELEMENTARY OCEANOGRAPHY | 01/1/2013 | 3 | Natural Science | | Reviewed: Updated | General Education (Core) | Course Description | 22 | |
| FLORIDA A & M UNIVERSITY | PHY | 1 | 020 | | FUNDAMENTAL OF PHYSICS | 01/1/2013 | 3 | Natural Science | | Reviewed: No Updates | General Education (Core) | Course Description | 23 | Not showing up in state list. |
| FLORIDA A & M UNIVERSITY | PHY | 1 | 020 | L | FUNDAMENTAL OF PHYSICS | 01/1/2013 | 1 | Natural Science | | Reviewed: No Updates | General Education (Core) | Course Description | 25 | Not showing up in state list. |
| FLORIDA A & M UNIVERSITY | MGF | 1 | 130 | | Mathematical Thinking | 6/3/24 | 3.0 | Mathematics | Mathematics | Reviewed: Updated | Both General Education (Core/Institution) | Course Description | | New Course added to meet regulation 8.005 |

**Florida A University**
**2024 General Education Course Offerings Report**

| Institution | Prefix | Level | Course Number | Lab | Course Title | Date of Last Update | Credit | General Ed Core | General Ed Requirements | Course Review Status | General Education Updates | Additional Updates | Total # Institutions Offering Course | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLORIDA A & M UNIVERSITY | MGF | 1 | 131 | | Mathematics in Contexts | 6/3/24 | 3.0 | | Mathematics | Reviewed: Updated | General Education (Institution) | Course Description | | New Course added to meet regulation 8.005 |

Updated 05/17/2024

FLORIDA A&M UNIVERSITY

**Board of Trustees**
**ACTION ITEM**

Academic and Student Affairs Committee
Monday, May 20, 2024
Agenda Item: VIII

**Subject**: Request to Reduce Degree Program Hours: B.S. Chemical Engineering and Biomedical Engineering

**Rationale:** The faculty members of the Chemical Engineering and Biomedical Engineering programs are proposing a reduction in the total number of credit hours required for their respective degrees from 131 to 128. The primary objective of this proposed action is to improve student outcomes, including graduation rates, retention, and persistence, for those enrolled in these programs. Additionally, this change will align the credit hour requirements of these programs with other undergraduate programs offered by the FAMU-FSU College of Engineering.

**Proposed Board Action**: Approve the reduction in the total number of credit hours required for the Chemical Engineering and Biomedical Engineering degrees offered within the FAMU-FSU College of Engineering from 131 to 128.

**Attachments**: Revised Curriculum Guides

**UPDATED CURRICULUM** (Reduction from 131 to 128 hours was achieved by removing one of the four 3-credit hour electives in the Curriculum).

**2023-2024 Curriculum Guide** **BS Degree in Biomedical Engineering** **128 Credit Hours**

**Florida A & M University** **Cell & Bioprocess Majors**

| FRESHMAN YEAR (1ST) | | SOPHOMORE YEAR (2ND) | | JUNIOR YEAR (3RD) | | SENIOR YEAR (4TH) | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **Fall Semester** | **15** | **Fall Semester** | **16** | **Fall Semester** | **16** | **Fall Semester** | **13** |
| CHM 1045 - Gen Chemistry I | 3 | ECH 3023 - Mass & Energy Bal I | 3 | BME 3622 - Biothermodynamics | 3 | BME 4332 - Cell & Tissue Engr | 3 |
| CHM 1045L - Gen Chem I Lab | 1 | CHM 2210 - Organic Chemistry I | 3 | BME 3631 - Biotransport Phenom | 3 | BME 4332L – Cell&TissEngr Lab | 1 |
| MAC 2311 - Calculus I [1] | 4 | MAC 2313 - Calculus III | 5 | BME 3702 - Biocomputations | 4 | BME 4801 - BME Design I | 3 |
| ENC 1101 - English I | 3 | PHY 2048 - Gen Physics I | 4 | BME 4403C – QtAnatSystPhys I | 3 | BME Senior Elective I [4] | 3 |
| AMH 2091, AFA2000, AFA3104 | 3 | PHY 2048L - Gen Physics I Lab | 1 | Social Science II (statewide/FAMU) | 3 | ECH 4504 - Kinetics&ReactorDes | 3 |
| EGN 1004L - 1st Yr Engr Lab | 1 | | | | | | |
| | | | | | | | |
| **Spring Semester** | **14** | **Spring Semester** | **16** | **Spring Semester** | **13** | **Spring Semester** | **13** |
| CHM 1046 - Gen Chemistry II | 3 | ECH 3024 - Mass & Energy Bal II | 4 | BME 3100 - Biomaterials | 3 | BME 4744C - Biodynamics&Contrl | 4 |
| CHM 1046L - Gen Chem II Lab | 1 | ECH 3301 - Process Anly & Des | 4 | BME 4211 - Biomechanics | 3 | BME 4802 - BME Design II | 3 |
| MAC 2312 - Calculus II | 4 | CHM 2211 - Organic Chemistry II | 3 | BME 4404C - QtAnatSystPhys II | 3 | BME Senior Elective II [4] | 3 |
| ENC 1102 - English II | 3 | PHY 2049 - Gen Physics II | 4 | BME 4503 - Bioinstrumentation | 3 | BME Senior Elective III [4] | 3 |
| BSC 1010 - General Biology I | 3 | PHY 2049L - Gen Physics II Lab | 1 | BME 4503L - Bioinstrument Lab | 1 | | |
| | | | | | | | |
| **Summer Semester [3]** | **9** | **Summer Semester [3]** | **3** | **Summer Semester** | **0** | **Summer Semester** | **0** |
| Humanities I (statewide list) | 3 | BME 3009 - Intro Biomed Engr | 3 | | | | |
| Humanities II (statewide/FAMU) | 3 | *(see Note 3, below)* | | | | | |
| Social Science I (statewide list) | 3 | | | | | | |
| | | | | | | | |

**[1] Students taking MAC 1105, MAC 1114, and/or MAC 1140 as prerequisites to MAC 2311 should take a math course every term (including summers) until completing the math sequence.**

**[2] History, Social Science, and Humanities electives are to be selected to satisfy the FAMU General Education requirements. This information can be found here: https://www.famu.edu/index.cfm?Registrar&GeneralEducationCompetenciesandCoreCourses. Please note that students beginning college in Fall 2021 must also meet the Civic Literacy requirement by taking AMH 2020 (history) or POS 1041 (social science) AND pass the Florida Civic Literacy Exam; those before must take a civics course OR pass the U.S. Naturalization exam.**

**[3] Most courses shown in the Freshman and Sophomore years of this Guide are also taught during the Summer terms, during which students are encouraged to make up missed classes. Nine (9) hours of summer credit must be taken at one of the twelve state universities in Florida sometime during the college career.**

**[4] See approved Biomedical Engineering electives on reverse side.**

**UPDATED CURRICULUM** (The college updated its requirement so that only two (2) Social Sciences/Humanities courses were needed in the engineering undergraduate curriculum instead of three (3). As a result of this, Chemical Engineering could drop 3 hours to go from 131 to 128 hours).

**2023-2024 Curriculum Guide** **BS Degree in Chemical Engineering** **128 Credit Hours**

**Florida A&M University** **Chemical Engineering and ChE-Materials Engineering Majors**

| FRESHMAN YEAR (1ST) | | SOPHOMORE YEAR (2ND) | | JUNIOR YEAR (3RD) | | SENIOR YEAR (4TH) | |
|---|---|---|---|---|---|---|---|
| **Fall Semester** | **15** | **Fall Semester** | **16** | **Fall Semester** | **16** | **Fall Semester** | **13** |
| CHM 1045 - Gen Chemistry I | 3 | ECH 3023 - Mass & Energy Bal I | 3 | ECH 3101 - Thermodynamics | 3 | ECH 4404L - Unit Ops Lab | 3 |
| CHM 1045L - Gen Chem I Lab | 1 | CHM 2210 - Organic Chem I | 3 | ECH 3266 - Transport Phenom I | 3 | ECH 4504 - Kinetics & React Des | 3 |
| MAC 2311 - Calculus I [1] | 4 | MAC 2313 - Calculus III | 5 | ECH 3854 - ChE Computations | 4 | ECH 4604 - ChE Process Design I | 4 |
| ENC 1101 - English I | 3 | PHY 2048 - Gen Physics I | 4 | ECH 3844 - Chem Engr Statistics | 3 | Chemical Engr Elective I [4] | 3 |
| AMH 2091, AFA2000, AFA3104 [2] | 3 | PHY 2048L - Gen Physics I Lab | 1 | Social Sci. II (FAMU list) [2] | 3 | | |
| EGN 1004L - 1st Yr Engr Lab | 1 | | | | | | |
| | | | | | | | |
| **Spring Semester** | **14** | **Spring Semester** | **16** | **Spring Semester** | **16/15** | **Spring Semester** | **14/13** |
| CHM 1046 - Gen Chemistry II | 3 | ECH 3024 - Mass & Energy Bal II | 4 | ECH 3274L - Transport Phen Lab | 3 | ECH 4323 - Process Control | 3 |
| CHM 1046L - Gen Chem II Lab | 1 | ECH 3301 - Process Anly & Des | 4 | ECH 3418 - Separations Processes | 3 | ECH 4323L - Process Control Lab | 1 |
| MAC 2312 - Calculus II | 4 | CHM 2211 - Organic Chem II | 3 | ECH 4267 - Transport Phenom II | 3 | ECH 4615 - ChE Process Des. II | 3 |
| ENC 1102 - English II | 3 | PHY 2049 - Gen Physics II | 4 | General Engineering course [5] | 4/3 | Chemical Engr Elective II [4] | 3 |
| BSC 1010 – General Biology I | 3 | PHY 2049L - Gen Physics II Lab | 1 | CHM/BCH/ECH XXXX – AdvChemEl[4] | 3 | General Engineering course [5] | 4/3 |
| | | | | | | | |
| **Summer Semester [3]** | **9** | **Summer Semester [3]** | **0** | **Summer Semester** | **0** | **Summer Semester** | **0** |
| Humanities I (statewide list) [2] | 3 | *(see Note 3, below)* | | | | | |
| Humanities II (statewide/FAMU list) [2] | 3 | | | | | | |
| Social Science I (statewide list) [2] | 3 | | | | | | |
| | | | | | | | |

**[1] Students taking MAC 1105, MAC 1114, and/or MAC 1140 as prerequisites to MAC 2311 should take a math course every term (including summers) until completing the math sequence.**
**[2] History, Social Science, and Humanities electives are to be selected to satisfy the FAMU General Education requirements. This information can be found here: https://www.famu.edu/index.cfm?Registrar&GeneralEducationCompetenciesandCoreCourses. Please note that students beginning college in Fall 2021 must also meet the Civic Literacy requirement by taking AMH 2020 (history) or POS 1041 (social science) AND pass the Florida Civic Literacy Exam; those before must take a civics course OR pass the U.S. Naturalization exam.**
**[3] Most courses shown in the Freshman and Sophomore years of this Guide are also taught during the Summer terms, during which students are encouraged to make up missed classes. Nine (9) hours of summer credit must be taken at one of the twelve state universities in Florida sometime during the college career.**
**[4] See approved Advanced Chemistry and Chemical Engineering electives on reverse side.**
**5 General Engineering courses must include EGM3512 – Engr Mechanics (4 hours) and EEL3003 – Intro to Electrical Engr (3 hours)**

FLORIDA A&M UNIVERSITY

**Board of Trustees**
**ACTION ITEM**

Academic and Student Affairs Committee
Monday, May 20, 2024
Agenda Item: IX

**Subject**: Request for Approval of New Graduates Degrees in Aerospace Engineering

**Rationale:** The FAMU-FSU College of Engineering is seeking to implement new graduate level programs in aerospace engineering at the master's and doctoral levels. The proposed programs will leverage the existing faculty and resources of the FAMU-FSU College of Engineering to offer the joint degrees. The curricula will include theoretical and applied aspects of fluid dynamics, gas dynamics, fluid-structure interactions, smart materials, uncertainty quantification, and flow control. The master's program will focus on experiential learning and industry collaboration. The doctoral program will foster research excellence within the discipline and industry. The master's degree requires 30 credits, while the doctoral degree requires 48 credits for those with a master's degree and 60 credits for those entering with a bachelor's degree.

**Proposed Board Action**: Approve master's and doctoral programs in Aerospace Engineering

**Attachments**: Aerospace Engineering Executive Summary and Degree Proposals

FLORIDA A&M UNIVERSITY

****Executive Summary****

Florida A&M University and Florida State University propose to offer a master's and Ph.D. in Aerospace Engineering within the joint FAMU-FSU College of Engineering, effective fall of 2025. The program will consist of one major with a minimum of 30 credit hours for a master's degree and 48 credits for a doctoral degree. Alternatively, for students entering the doctoral program immediately after their bachelor's degree, completion requires 60 credits. The program directly supports the following goals of the Board of Governors and FAMU.

- Increase degree offerings Science, Technology, Engineering, and Math (STEM)
- Expand and enhance cutting-edge research and creative scholarship for the benefit of the State of Florida, the nation, and the world.
- Increase research productivity, commercialization and return on investment.
- Increase the number of nationally recognized graduate programs.

The Department of Mechanical Engineering (ME) at FAMU-FSU College of Engineering has a long history of excellence in research and teaching in the fields of fluid dynamics, aerodynamics, and flow control. The ME Department currently offers a wide range of fundamental core and technical electives in fields ranging from fluid dynamics theory, gas dynamics, fluid-structure interactions, smart materials, uncertainty quantification, and flow control. The demand for aerospace engineers is particularly pronounced in high-technology sectors that support aircraft development, such as manufacturing, electronics, human performance in space, and sensing. The Bureau of Labor Statistics anticipates a 6% percent growth in the employment of aerospace engineers from 2022 to 2032. The anticipated percent growth in employment of aerospace engineers from 2023-2031 is 18.4% in Florida – which is three times the national growth rate.

**Projected Enrollments and Program Costs**

| Implementation Timeframe | HC | FTE | E&G Cost per FTE | E&G Funds | Contract & Grants Funds | Auxiliary/ Philanthropy Funds | Total Cost |
|---|---|---|---|---|---|---|---|
| Year 1 | 25 | 18 | $17,101 | $307,825 | $456,871 | | $764,696 |
| Year 2 | 45 | 35 | | | | | |
| Year 3 | 51 | 48 | | | | | |
| Year 4 | 67 | 67 | | | | | |
| Year 5 | 75 | 61 | $11,531 | $703,375 | $1,158,849 | | $1,862,223 |

**Admissions and Graduation Requirements**

*Master's:* Prospective students must have a BS degree (or a recognized equivalent) in Mechanical or Aerospace Engineering or any related field. Applicants must have at least a 3.0 upper-division GPA and GRE General Exam scores or an approved GRE waiver. Applicants must also submit a personal/research statement, résumé, and three letters of recommendation. All students in the thesis option, must take a minimum of 30 credit hours. They must also write, present, and successfully defend a thesis on their research. Students enrolled in the non-thesis option must take 30 credit hours, of which at least 27 credit hours of coursework within aerospace or mechanical engineering.

*Ph.D.:* Prospective students must have an MS degree in Mechanical or Aerospace Engineering or any related fields. Applicants must have at least a 3.0 upper-division GPA and GRE General Exam scores or an approved GRE waiver. All Ph.D. students must satisfactorily complete a preliminary examination, prospectus defense, dissertation defense.

**Curriculum**

The curriculum will be identical for FAMU and FSU students. In their first year, students will gain a firm grounding in the fundamentals of AE through core courses (12 credits) taught by faculty members within the Mechanical Engineering department (these courses are already available). The student and their research advisor will determine which elective specialization courses are best for their research. Students will also register for the existing weekly Mechanical Engineering Graduate Seminar Series, taken every semester through graduation (0 credits). In this seminar series, students will be exposed to FAMU and FSU faculty and external researchers working in areas highly relevant to aerospace engineering (e.g., fluid dynamics, controls, robotics, thermal transport, large-scale computations, mechanics of materials). This seminar series also includes discussions about professional development skills given by industry speakers, government laboratory researchers, and academics about leadership strategies and tactics.

STATE UNIVERSITY SYSTEM OF FLORIDA

State University System of Florida Board of Governors

# REQUEST TO OFFER A NEW DEGREE PROGRAM

In accordance with Board of Governors Regulation 8.011

(Please do not revise this proposal format without prior approval from Board staff)

| | |
|---|---|
| **Florida A&M University**<br>**Institution Submitting Proposal** | **Fall 2025**<br>**Name of Department(s)/Division(s)** |
| **FAMU-FSU College of Engineering**<br>**Name of College(s) or School(s)** | **Aerospace Engineering**<br>**Complete Name of Degree** |
| **Aerospace Engineering**<br>**Academic Specialty or Field** | **Proposed Program Type**<br>☒ **E&G Program**<br>☐ **Market Tuition Rate Program**<br>☐ **Self-Supporting Program** |
| **Proposed CIP Code (2020 CIP)**<br>**14.0201**<br>**Proposed Implementation Term** | |

**The submission of this proposal constitutes a commitment by the university that, if the proposal is approved, the necessary financial resources and the criteria for establishing new programs have been met before the program's initiation.**

| | |
|---|---|
| **May 29, 2024**<br>**Date Approved by the University Board of Trustees** | Larry Robinson 5/17/2024<br>**President's Signature** **Date** |
| **Board of Trustees Chair's Signature** **Date** | Allyson Watson 5/15/2024<br>**Provost's Signature** **Date** |

**Projected Enrollments and Program Costs**

**Provide headcount (HC) and full-time equivalent (FTE) student estimates for Years 1 through 5. HC and FTE estimates should be identical to those in Appendix A – Table 1. Indicate the program costs for the first and the fifth years of implementation as shown in the appropriate columns in Appendix A – Table 3A or 3B. Calculate an Educational and General (E&G) cost per FTE for Years 1 and 5 by dividing the total E&G by FTE.**

| Implementation Timeframe | HC | FTE | E&G Cost per FTE | E&G Funds | Contract & Grants Funds | Auxiliary/ Philanthropy Funds | Total Cost |
|---|---|---|---|---|---|---|---|
| **Year 1** | 25 | 18 | $17,101 | $307,825 | $456,871 | | $764,696 |
| **Year 2** | 45 | 35 | | | | | |
| **Year 3** | 51 | 48 | | | | | |
| **Year 4** | 67 | 67 | | | | | |
| **Year 5** | 75 | 61 | $11,531 | $703,375 | $1,158,849 | | $1,862,223 |

**Programs of Strategic Emphasis Waiver** *(for baccalaureate programs only)*

**Does the program fall under one of the CIP codes listed below?**

☐ **Yes**
☒ **No**

If yes, students in the program will be eligible for the Programs of Strategic Emphasis (PSE) waiver. See Board Regulation 7.008 and the PSE Waiver Guidance for additional details.

| CIP CODE | CIP TITLE | CATEGORY |
|---|---|---|
| **11.0101** | Computer and Information Sciences | STEM |
| **11.0103** | Information Technology | STEM |
| **13.1001** | Special Education | EDUCATION |
| **13.1202** | Elementary Teacher Education | EDUCATION |
| **14.0801** | Civil Engineering | STEM |
| **14.0901** | Computer Engineering | STEM |
| **14.1001** | Electrical and Electronics Engineering | STEM |
| **27.0101** | Mathematics | STEM |
| **40.0801** | Physics | STEM |
| **52.0301** | Accounting | GAP ANALYSIS |
| **52.0801** | Finance | GAP ANALYSIS |
| **52.1201** | Management Information Systems | STEM |

**Additional Required Signatures**

**I confirm that I have reviewed and approved Need and Demand Section III.F. of this proposal.**

_____ _____

**Signature of Equal Opportunity Officer** **Date of Signature**

**I confirm that I have reviewed and approved Non-Faculty Resources Section IX.A. and IX.B. of this proposal.**

Faye Watkins
**Signature of Library Dean/Director**

5/15/2024
**Date of Signature**

**Introduction**

**I. Program Description and Relationship to System-Level Goals**

**A. Describe within a few paragraphs the proposed program under consideration and its overall purpose, including:**

- **degree level(s)**
- **majors, concentrations, tracks, specializations, or areas of emphasis**
- **total number of credit hours**
- **possible career outcomes for each major (provide additional details on meeting workforce needs in Section III)**

Florida A&M and Florida State Universities propose to offer a graduate degree program in Aerospace Engineering (AE) beginning Spring 2025. The graduate program will offer master's and doctoral degrees. The proposed program will be offered jointly within the FAMU-FSU College of Engineering and operate within the FAMU-FSU Mechanical Engineering Department. It will use faculty that currently teach within the existing Mechanical Engineering program at the FAMU-FSU College of Engineering. Additional faculty hires are proposed to expand the program in strategic directions that build upon existing strengths and future challenges in aerospace fields.

The AE graduate program will consist of one major. Completion of the master's program, whether thesis or non-thesis, requires a minimum of 30 credits. For students holding a master's degree, completion of the doctoral program requires 48 credits. Alternatively, for students entering the doctoral program immediately after their bachelor's degree, completion requires 60 credits. In their first year, students will gain a firm grounding in the fundamentals of AE through core courses (12 credits) taught by faculty members within the Mechanical Engineering department (these courses are already available). The student and their research advisor will determine which elective specialization courses are best for their research. Students will also register for the existing weekly Mechanical Engineering Graduate Seminar Series, taken every semester through graduation (0 credits). In this seminar series, students will be exposed to FAMU and FSU faculty and external researchers working in areas highly relevant to aerospace engineering (e.g., fluid dynamics, controls, robotics, thermal transport, large-scale computations, mechanics of materials). This seminar series also includes discussions about professional development skills given by industry speakers, government laboratory researchers, and academics about leadership strategies and tactics.

As background information, Aerospace Engineering primarily revolves around creating, advancing, testing, and manufacturing aircraft, spacecraft, and associated systems and structures. Historically, the discipline has centered on challenges about atmospheric and

space travel, encompassing two key and interconnected branches: aeronautical engineering, which concentrates on the theory, technology development, and application of flight within Earth's atmosphere, and astronautical engineering, which delves into the science and technology of spacecraft and launch vehicles. Aerospace engineers play a crucial role in advancing technologies and incorporating them into aerospace vehicle systems for various purposes such as transportation, communication, exploration, and defense. Their responsibilities encompass the creation and production of aircraft, spacecraft, propulsion systems, satellites, and missiles. Additionally, they are involved in designing and testing various components and subassemblies related to aircraft and aerospace products. The AE program at FAMU and FSU will advance the State and Federal calls to increase competence in science, technology, engineering, and math (STEM) in upcoming generations and to promote advanced aerospace engineering to solve fundamental problems that have immediate technical applications. In Florida, the aerospace industry is an essential component of the State's economy. Furthermore, there are several federal research laboratories in the Panhandle region, including Eglin and Tyndall Air Force Bases, the Naval Surface Warfare Center—Panama City Division and the Naval Air Station in Pensacola, that need new, well-trained AE graduates in their workforce. In addition, many industries in Florida, like defense and aerospace contractors, need aerospace engineers at the master's and doctoral level. With the advanced knowledge attained in aerospace engineering, graduates of the program will demonstrate the application of acquired knowledge through analyzing, synthesizing, evaluating, and creating solutions in various disciplines such as materials, thermal management, fluid dynamics, acoustics, controls, solid mechanics, among others. They will effectively transfer this knowledge to innovate future aerospace technologies, both locally in the State of Florida and globally. Furthermore, doctoral-trained graduates are also eligible for careers in academia.

**B. If the proposed program qualifies as a Program of Strategic Emphasis, as described in the Florida Board of Governors 2025 System Strategic Plan, indicate the category.**

- **Critical Workforce**
  - ☐ Education
  - ☐ Health
  - ☐ Gap Analysis
- **Economic Development**
  - ☐ Global Competitiveness
  - ☒ Science, Technology, Engineering, and Math (STEM)

☐ **Does not qualify as a Program of Strategic Emphasis.**

## II. Strategic Plan Alignment, Projected Benefits, and Institutional Mission and Strength

**A. Describe how the proposed program directly or indirectly supports the following:**

- **System strategic planning goals (see the link to the 2025 System Strategic Plan on the New Program Proposals & Resources webpage)**
- **the institution's mission**
- **the institution's strategic plan**

The AE program contributes directly to several of the State University System (SUS) Strategic Planning Goals in the 2025 System Strategic Plan. The specific areas in which the PhD in AE will impact or contribute are:

- Teaching and Learning
    - Strengthen the Quality and Reputation of the Universities
    - Increase Degree Productivity & Program Efficiency
    - Increase the Number of Degrees Awarded in Programs of Strategic Emphasis
- Scholarship, Research and Innovation
    - Increase Research Activity and Attract More External Funding

The new AE program also aligns well with the mission of Florida State University which involves incorporating elements that preserve, expand, and disseminate knowledge in various disciplines while emphasizing a philosophy of learning rooted in the liberal arts tradition. For example, the AE program will adopt an interdisciplinary approach, integrating the physics of fluids, materials, mathematics, technology, and professional development. This approach ensures a well-rounded education, aligning with the university's commitment to preserving and expanding knowledge across diverse fields. While this program heavily focuses on engineering, liberal arts will also be components within the aerospace curriculum. This will involve including courses and training that foster critical thinking, communication skills, and ethical considerations, thereby ensuring graduates possess a holistic education that extends beyond their technical knowledge.

The program will also include a curriculum that emphasizes excellence in teaching and research. We will provide students with opportunities to engage in cutting-edge research, collaborate with industry professionals, and participate in hands-on projects that contribute to advancements in aerospace engineering and technology. The AE program will also foster a culture of creativity and innovation within the program. It will encourage students to explore novel ideas, pursue entrepreneurial endeavors, and contribute to developing new technologies and solutions in the aerospace industry. This program will also include service-learning components that allow students to apply their aerospace knowledge to address real-world challenges. Many opportunities exist within the Department of Engineering via the Mechanical Engineering Graduate Student Association (MEGSA—RSO [Recognized Student Organization]) to encourage community engagement, partnerships with local industries, and outreach programs, such as the Challenger Learning Center, that contribute to the betterment of society. As part of the College of Engineering and Department of Mechanical Engineering's mission of leadership and professional development, we will also emphasize the development of ethics, skill, and character in students. We will provide opportunities for personal and professional growth, instilling a commitment to lifelong learning from coursework and research experiences. We will foster an environment that encourages personal responsibility and sustained achievement through active engagements with faculty throughout their graduate program. The new AE graduate program will cultivate a program that embraces diversity and inclusion. This includes creating a supportive and inclusive learning environment that reflects the university, college and department's commitment to a community fostering free inquiry.

By incorporating these elements, the aerospace graduate program can effectively align

with Florida State University's mission, contributing to the preservation, expansion, and dissemination of knowledge while fostering a commitment to excellence, diversity, and community engagement.

The AE program is also consistent with FAMU's mission. Florida Agricultural and Mechanical University (FAMU) is an 1890 land-grant institution dedicated to the advancement of knowledge, the resolution of complex issues, and the empowerment of citizens. FAMU's distinction as a doctoral/research institution will continue to provide mechanisms to address emerging issues through local and global partnerships. Expanding upon the University's land-grant status will enhance the lives of constituents through innovative research, engaging cooperative extension, and public service.

In direct support of its mission, the proposed AE program aligns with FAMU's dedication to the "advancement of knowledge and resolution of complex issues." There are several ways in which aerospace engineering contributes to these advancements including:

1. Technological Innovation: Aerospace engineering is at the forefront of technological innovation. The field constantly pushes the boundaries of flow physics, materials and structures operating in extreme environments, and complex control theories, leading to developing cutting-edge technologies and solutions. This innovation not only improves aerospace systems but often has broader applications in other industries.

2. Scientific Discovery: The pursuit of aerospace engineering often involves exploring unknown frontiers in both space exploration and atmospheric research. This exploration leads to new scientific discoveries and motivates a deeper understanding of fundamental principles in physics, materials science, computational science, and other related disciplines.

3. Environmental Sustainability: Aerospace engineers work towards making air and space travel more environmentally sustainable. This involves developing fuel-efficient propulsion systems, light-weight materials, and exploring alternative energy sources. As air and space vehicles are pushed to high speeds and more frequent use, addressing the environmental impact of aerospace activities contributes to important global sustainability challenges.

4. National Security and Defense: Aerospace engineering is integral to the development of defense and security technologies. Advancements in aircraft design, missile systems, and satellite technology contribute to national defense capabilities and strategic security.

5. Space Exploration and Colonization: Aerospace engineering drives advancements in developing spacecraft, propulsion systems, life support systems, and robotics for exploring other planets. The knowledge gained from these endeavors contributes not only to space science but also to potential future human colonization of other celestial bodies.

6. Communication and Connectivity: Aerospace engineering is instrumental in the development of satellite systems that enable global communication, weather monitoring, navigation, and Earth observation. These systems contribute to enhanced connectivity, disaster management, and a greater understanding of global climate

patterns.

7. Medical and Biological Research: Space missions often involve experiments in microgravity environments. The results of these experiments can have applications in medical and biological research on Earth. For example, studying the effects of space travel on the human body contributes to our understanding of physiology and potential medical advancements.

8. Global Collaborations: Many aerospace projects involve international collaborations. Working together on projects such as space exploration or satellite programs fosters global cooperation and the sharing of knowledge and resources, contributing to peaceful relations and diplomacy.

Overall, aerospace engineering contributes to the advancement of knowledge and the resolution of complex issues by driving technological innovation, exploring new frontiers, addressing environmental challenges, enhancing national security, enabling global connectivity, inspiring education, and fostering global collaboration. The interdisciplinary nature of aerospace engineering ensures that its impact extends far beyond the confines of the field itself.

Along with the Board of Governors' 2025 Strategic Plan and the FSU and FAMU missions, the proposed AE program aligns well with FAMU's goal for High Impact Research, Commercialization, Outreach, and Extension Services. Specific to Strategic Priority 3 of FAMURising, the graduate program in AE will address the following goals:

- Goal 1: Expand and enhance cutting-edge research and creative scholarship for the benefit of the State of Florida, the nation, and the world.
- Goal 2: Increase research productivity, commercialization and return on investment.
- Goal 3: Increase the number of nationally recognized graduate programs.

A graduate program in Aerospace Engineering will add opportunities for FAMU and the Joint College faculty to engage in cutting-edge research to keep pace with constantly changing societal needs for safe and efficient aircraft and provide a workforce that can design, test and manufacture aerospace technology for the benefit of the nation as a whole. Faculty associated with the program are already active in research. The graduate program will serve to increase their research contributions to FSU, FAMU and the State of Florida, and train graduates who can also use advanced knowledge in positions that require advanced decision-making and skills necessary to implement effective solutions around the development and deployment of aerospace systems and structures. Having a strong research-oriented doctoral program attracts increased numbers of students with diverse backgrounds, which is also aligned with FAMU's mission.

**B. Describe how the proposed program specifically relates to existing institutional strengths. This can include:**
- **existing related academic programs**
- **existing programs of strategic emphasis**
- **institutes and centers**
- **other strengths of the institution**

The Department of Mechanical Engineering (ME) at FAMU-FSU has a long history of

excellence in research and teaching in the fields of fluid dynamics, aerodynamics, and flow control. Current ME faculty are internationally recognized in aerodynamics research and are very active in a wide range of federally funded research programs in both experimental and computational aerodynamics. The research enterprise has been successful not only because of excellent faculty, but also for very talented and well-trained graduate and undergraduate students. The ME Department offers a wide range of fundamental core and technical electives in fields ranging from fluid dynamics theory, gas dynamics, fluid-structure interactions, smart materials, uncertainty quantification, and flow control. These courses are offered to graduate students to support their research. Our undergraduate courses in areas related to aerodynamics start at the sophomore level and continue through senior technical electives to prepare these students for successful careers in industry and graduate school.

With respect to strategic interest, aerodynamic engineering is well aligned with STEM and supports the overall strategic vision of the State of Florida. It is also well aligned with both universities as FSU has a strong interest in expanding aerodynamics research in the Panhandle through the new Triumph program in Panama City. This program will require support from faculty to help guide the research and develop academic programs to support this major external investment of $98M. FAMU is also very interested in growing STEM programs to increase African American graduates in the field of aerospace engineering. We expect these new activities will attract more students, post doctorate researchers, and research dollars which will help propel FAMU to a research intensive (R1) university.

Aerospace graduate education and research is also well aligned with institutes and centers at FAMU and FSU. The Aero-Propulsion, Mechatronics, and Energy (AME) Building supports the educational and research mission of the Florida Center for Advanced Aero-Propulsion (FCAAP) Center within the FAMU-FSU College of Engineering. FCAAP is a state-funded center that started in 2008 to support research and workforce development in the State of Florida. This center is headquartered at FSU and includes faculty at multiple universities across the state including FAMU, the University of Florida, the University of Central Florida, and Embry-Riddle. Additional long-running research centers have been spun off of FCAAP, including a Federal Aviation Administration Center of Excellence on Commercial Space Transport (2011-2021) and a more recent Air Force Office of Scientific Research (AFOSR) Center of Excellence AEROMORPH on morphing high speed aircraft (awarded 2023). These research centers provide excellent experimental and computational resources and exceptional faculty that will be leveraged in this program.

Additional strengths worth noting include recently developed aerospace educational programs within the Mechanical Engineering Department. This includes an online Aerospace Certificate program through FSU that started in the fall of 2021. Given its relevance to the proposed graduate program, key dates associated with this online certificate are included in the planning process table. Several faculty members within the Mechanical Engineering Department (led by Prof. Rajan Kumar) are also involved with an Air Force Research Laboratory (AFRL) Scholars program where undergraduate and graduate students take courses and conduct experiments within the ME department during fall and spring semesters and spend summers working with AFRL scientists at Eglin and Wright Patterson Air Force Bases. This collaboration may be in the form of on-site work at AFRL or conducting experiments at FCAAP and reporting to AFRL scientists.

A similar program exists through a FAMU NASA MUREP program to support minority students interested in aerospace research. This program is led by a former department chair within the ME Department, Prof. Chiang Shih, and Co-PI Prof. Carl Moore. Lastly, the ME Department also runs a NASA University Leadership Initiative, led by Prof. Lance Cooley, which focuses on hydrogen-based aero-propulsion concepts. This not only aligns with the mission of the aerospace program but also the broader mission of FSU to support hydrogen energy applications. In summary, there are a large number of programs focused on aerospace engineering which provide excellent opportunities for graduate students interested in this field.

**C. Provide the date the pre-proposal was presented to the Council of Academic Vice Presidents Academic Program Coordination (CAVP ACG). Specify any concerns raised and provide a narrative explaining how each concern has been or will be addressed.**

No concerns were raised in the CAVP ACG on 11/15/2023.

**D. In the table below provide an overview of the institutional planning and approval process leading up to the submission of this proposal to the Board office. Include a chronology of all activities, providing the names and positions of university personnel and external individuals who participated.**

- **If the proposed program is at the bachelor's level, provide the date the program was entered into the APPRiSe system, and, if applicable, provide a narrative responding to any comments received through APPRiSe.**

- **If the proposed program is a doctoral-level program, provide the date(s) of the external consultant's review in the planning table. Include the external consultant's report and the institution's responses to the report as Appendix B.**

**Planning Process**

| Date | Participants | Planning Activity Description |
|---|---|---|
| May 29, 2015 | Chiang Shih and Jennifer Buchanan | Create a graduate program in Aerospace Engineering – Masters and Ph.D. |
| December 11, 2015 | CAVP Academic Coordination Group | First CAVP-ACG Meeting |
| January 2016<br><br>March 4, 2016 | Approval by FAMU UPARC and Provost<br>Review of FSU BOT | Proposal to Explore is approved by FSU BOT. No second proposal to explore is required. |
| June 12, 2018 | Murray Gibson, Farrukh Alvi, Eric Hellstrom, Rajan Kumar, and Chiang Shih | Create an online graduate certificate program in aeronautical engineering designed as a pathway to an MS/PhD program. |
| Summer 2018 | Lou Cattafesta, Rajan Kumar, and Chiang Shih | Meeting with FAMU-FSU college computing services (CCS) and FSU Office of Distance Learning |
| Fall 2018 | Lou Cattafesta and Rajan | Develop two pilot courses for the |

| | | |
|---|---|---|
| | Kumar | program |
| Spring 2019 | Mohd Ali, Jonas Gustavsson, Rajan Kumar, and Chiang Shih | Develop three more courses |
| Summer 2019 | Mohd Yousuf Ali, Jonas Gustavsson, Rajan Kumar, Lou Cattafesta, and Chiang Shih | Develop into fully asynchronous distance learning courses |
| Fall 2019 | Mohd Yousuf Ali, Jonas Gustavsson, Rajan Kumar, Lou Cattafesta, and Chiang Shih | Five graduate level courses are ready to be offered face-2-face and online asynchronously |
| November 2019 | Department of Mechanical Engineering's Graduate Committee chaired by William Oates | Department graduate committee approves to start a certificate program in Aerospace Engineering – Aerodynamics |
| December 2019 | FAMU-FSU College of Engineering – College Curriculum Committee<br><br>Sam Awoniyi, Linda DeBrunner, Patrick Hollis, John Telotte, Kamal Tawfiq, Deb Gautier, Subashini Iyer, Frederika Manciagli, Michelle Rambo-Roddenberry, Mohd Yousuf Ali, Lisa Spainhour | FAMU-FSU College of Engineering approves to start a certificate program in Aerospace Engineering – Aerodynamics |
| April 2020 | William Oates and Murray Gibson | FAMU and FSU approves the College of Engineering's recommended proposal to start a certificate program in Aerospace Engineering – Aerodynamics |
| Fall 2021 | Department of Mechanical Engineering | Online Graduate Certificate program in Aerospace Engineering – Aerodynamics is offered |
| 10/19/2023 | William Oates, Mohd Yousuf Ali, Jennifer Buchanan, Amy Guerette, and Sundra Kincey | Discuss pre-proposal for the graduate degree program in Aerospace engineering |
| 11/15/2023 | CAVP Academic Coordination Group | CAVP Pre-Proposal Approval |
| 11/28/2023 | William Oates, Mohd Yousuf Ali, Jennifer Buchanan, Amy Guerette, and Sundra Kincey | Proposed Aerospace program proposal guidelines |
| 12/07/2023 | William Oates, Mohd Yousuf Ali, Chaing Shih, Alex Berger, and Huixuan Wu | Proposal for FAMU-FSU Aerospace MS/PhD program |
| 12/08/2023 | William Oates, Mohd Yousuf Ali, and Kassidy Hof-Mahoney | Library resources for the proposed AE program |
| 01/29/2024 | William Oates, Mohd Yousuf Ali, Jennifer Buchanan, Amy Guerette, and Sundra Kincey | Aerospace Degree Proposal Follow-Up |

| | | |
|---|---|---|
| 02/22/2024 | Chair Oates & ME faculty | Status update on Aerospace Graduate Degree proposal developments |
| 02/27/2024 | William Oates and Wei Guo | Approval for the proposed graduate program in AE by the department graduate committee members |
| 03/01/2024 | William Oates, Michelle Rambo-Rodenberry, Kari Aime, and FAMU-FSU College of Engineering Curriculum Committee | Approval for the proposed graduate program in AE by the FAMU-FSU college of engineering curriculum committee members |
| 03/05/2024 | William Oates, Mohd Yousuf Ali, Jennifer Buchanan, Amy Guerette, and Sundra Kincey | Discuss next steps for approval from university curriculum committee |
| 03/05/2024 | Dr. Mark Glauser | External Reviewer has agreed to review the proposed program |

**E. In the table below, provide a timetable of key events necessary for implementing the proposed program following approval of the program by the Board office or the Board of Governors through to the addition of the program to the State University System Academic Degree Program Inventory.**

**Events Leading to Implementation**

| Date | Implementation Activity |
|---|---|
| June 20 | BOT review and request for approval |
| June - July 2024 | Board of Governors Staff Review for BOG Consideration |
| June – July 2024 | Develop MOUs between collaborating departments |
| July – September 2024 | Collaborate with BOG Staff in Preparation for November BOG Meeting |
| November 2024 | Review by BOG |
| Fall 2024-Summer 2025 | Development of additional AE courses (1. Rotary Wing Aerodynamics, 2. Structural Dynamics, and 3. Fracture Mechanics) |
| Spring 2025 | Marketing and recruitment of students |
| Spring 2025 | Update internal systems |
| Fall 2025 | Enroll first cohort |

**Institutional and State-Level Accountability**

**III. Need and Demand**

**A. Describe the workforce need for the proposed program. The response should, at a minimum, include the following:**

- **current state workforce data as provided by Florida's Department of Economic Opportunity**
- **current national workforce data as provided by the U.S. Department of**

**Labor's Bureau of Labor Statistics**

- **requests for the proposed program from agencies or industries in the university's service area**
- **any specific needs for research and service that the program would fulfill**

Aerospace engineering includes interdisciplinary graduate training in fluid dynamics, structures, thermal transport, dynamics, control, and materials which relies heavily on experimental, computational, and theoretical research. Graduate research and workforce development is a pivotal driver for creating novel aerospace systems and enhancing existing ones, critical for the evolution of technologies in aerospace transportation as well as energy, avionics, communications, information, homeland security, and national defense. Major federal funding agencies, such as the National Science Foundation, Department of Energy, Department of Defense, and NASA, allocate significant resources to support extensive research programs in aerospace engineering. Moreover, many industries, particularly in the State of Florida, are invested in aerospace and are actively seeking knowledgeable professionals in this field.

The demand for aerospace engineers is particularly pronounced in high-technology sectors that support aircraft development such as manufacturing, electronics, human performance in space, and sensing. The Bureau of Labor Statistics anticipates a 6% percent growth in the employment of aerospace engineers from 2022 to 2032 (https://data.bls.gov/projections/occupationProj). Florida, with its significant presence in aerospace, defense, marine, and space industries, hosts major players like Lockheed Martin, Boeing, Raytheon, Northrop Grumman, and General Dynamics, all of which employ aerospace engineers. These professionals are crucial for the development and application of new materials and structures for lighter, fuel efficient, and agile military aircraft and cutting-edge commercial planes. Nationally renowned companies like Boeing, General Dynamics, GE, Lockheed Martin, and Northrop Grumman heavily involve aerospace engineers in key roles. The anticipated percent growth in employment of aerospace engineers from 2023-2031 is 18.4% in Florida – which is **three** times the national growth rate.

Aerospace engineering (AE) graduates find opportunities not only in corporate settings but also in national and industrial labs, contributing to research and development. The expanding budgets of federal agencies' Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs in AE fields indicate a growing demand for AE graduates. Recent placements from FAMU and FSU's Mechanical Engineering program highlight the strength of the job market, with graduates assuming leadership roles in big and small high-tech businesses. Notable employers include Space-X, Boeing, Northrop Grumman, and various national labs.

The Mechanical Engineering Department Chair has engaged with select companies and the Eglin Air Force Research Laboratory to explore their potential hiring of MS and PhD graduates in Aerospace Engineering. Positive responses indicate a demand for MS and doctoral-prepared graduates in AE. The salary outlook for these graduates is promising, with recent Ph.D. recipients from the existing program earning upwards of approximately $126,880 per year (**http://www.floridajobs.org/labor-market-information/data-center/statistical-programs/employment-projections**).

**National and Florida Workforce Demand**

**In the table below, provide occupational linkages or jobs graduates will be qualified to perform based on the training provided for the proposed program that does not currently appear in the most recent version of the Search by CIP or SOC Employment Projections Data Tool provided periodically by Board staff.**

**Occupational Linkages for the Proposed Program**

| SOC Code (XX-XXXX) | Occupation Title | Source / Reason for Inclusion |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**Complete the table below and summarize its contents in narrative form. Include data for all linked occupations, including those in the table above. Use data from the Search by CIP or SOC Employment Projections Data Tool provided periodically by Board staff.**

**Labor Market Demand, CIP Code 14.0201**

| Occupations | Percent Change in Job Openings | | Annual Average Job Openings | | Total # of New Jobs | | Education Level Needed for Entry |
|---|---|---|---|---|---|---|---|
| | FL 2023-31 | U.S. 2022-32 | FL 2023-31 | U.S. 2022-32 | FL 2023-31 | U.S. 2022-32 | |
| Aerospace Engineer | 18.4% | 6.1% | 499 | 3,800 | 1,085 | 3,900 | Bachelor's |
| Engineering Teachers, Post secondary | 15.8% | 9.3% | 89 | 4,100 | 128 | 4,200 | Doctoral Degree (Ph.D.) |

Sources:
Date Retrieved: 02/21/2024
U.S. Bureau of Labor Statistics - https://data.bls.gov/projections/occupationProj
Florida Department of Economic Opportunity - http://www.floridajobs.org/labor-market-information/data-center/statistical-programs/employment-projections

**B. Provide and describe data that support student demand for the proposed program. Include questions asked, results, and other communications with**

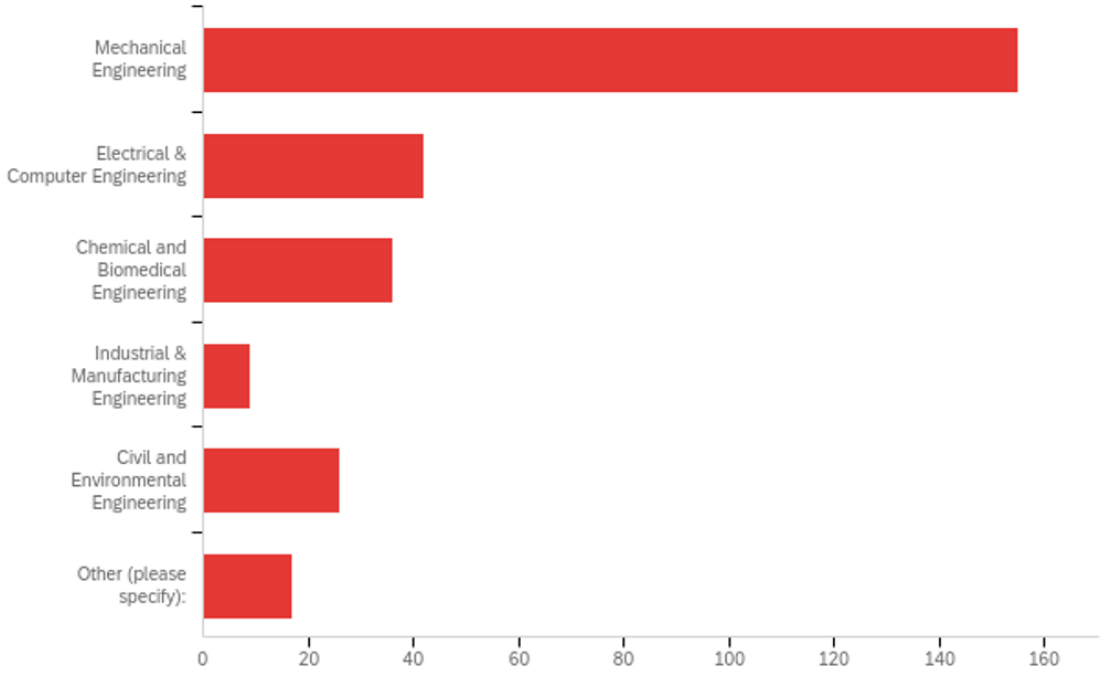
**prospective students.**

Prospective students are drawn to the prospect of enrolling in a graduate degree program in aerospace engineering due to the diverse career opportunities available in commercial aviation, defense, space exploration, and research. Pursuing a graduate degree is seen as a pathway to acquiring specialized knowledge and skills that can unlock lucrative and thrilling career paths. Florida, recognized as a hub for aerospace opportunities, provides an array of possibilities, including:

- NASA and Space Industry: The presence of the esteemed Kennedy Space Center offers aerospace engineers the chance to engage in various NASA missions, encompassing spacecraft launches and maintenance, research initiatives, and contributions to space exploration. Leading private space industry players like SpaceX, Blue Origin, and Boeing have firmly established themselves in Florida.
- Defense and Military: Florida is home to key military bases such as Eglin, Tyndall, and MacDill Air Force Research Laboratories, presenting opportunities in defense projects and technology. Aerospace engineers can contribute to defense-related initiatives, including the development of military aircraft, missile systems, and other defense technologies.
- Commercial Aviation: Prominent companies like Embraer, Spirit AeroSystems, and Lockheed Martin have a significant presence in Florida, offering compelling career opportunities for Ph.D. graduates.
- Space Tourism: The emerging sector of space tourism, led by companies like Virgin Galactic and Blue Origin, presents exciting prospects for aerospace engineers with graduate degrees to contribute to this groundbreaking industry.
- Education and Research: Aerospace engineers holding a PhD can explore opportunities in teaching, research, and curriculum development, contributing to the academic and research landscape of aerospace engineering.

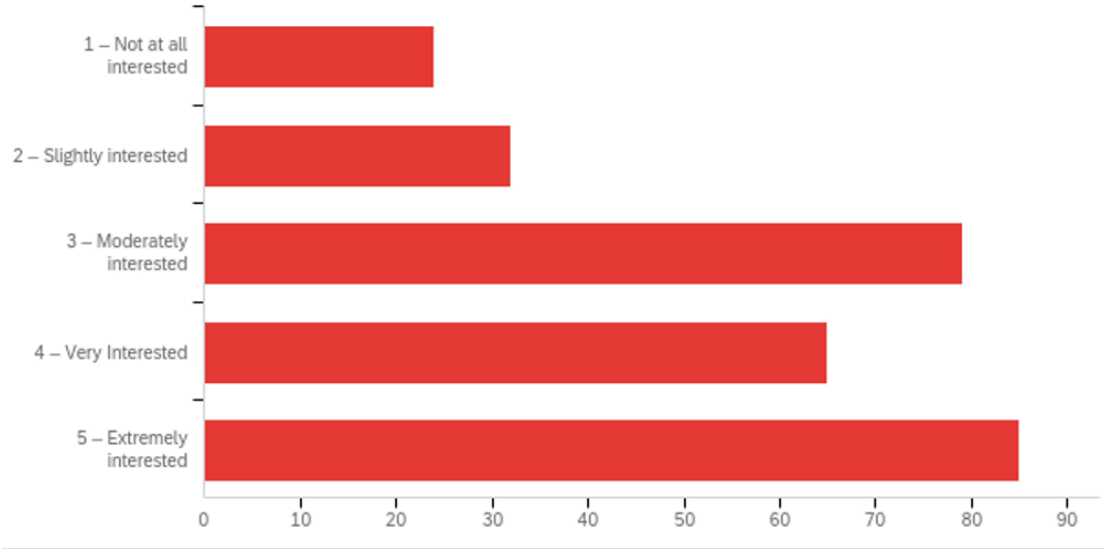
The FAMU-FSU College of Engineering conducted a survey to assess students' interest in pursuing graduate studies in Aerospace Engineering. The survey included the following questions, and it received responses from 289 individuals.

Q1 - What is your current undergraduate major or field of study?



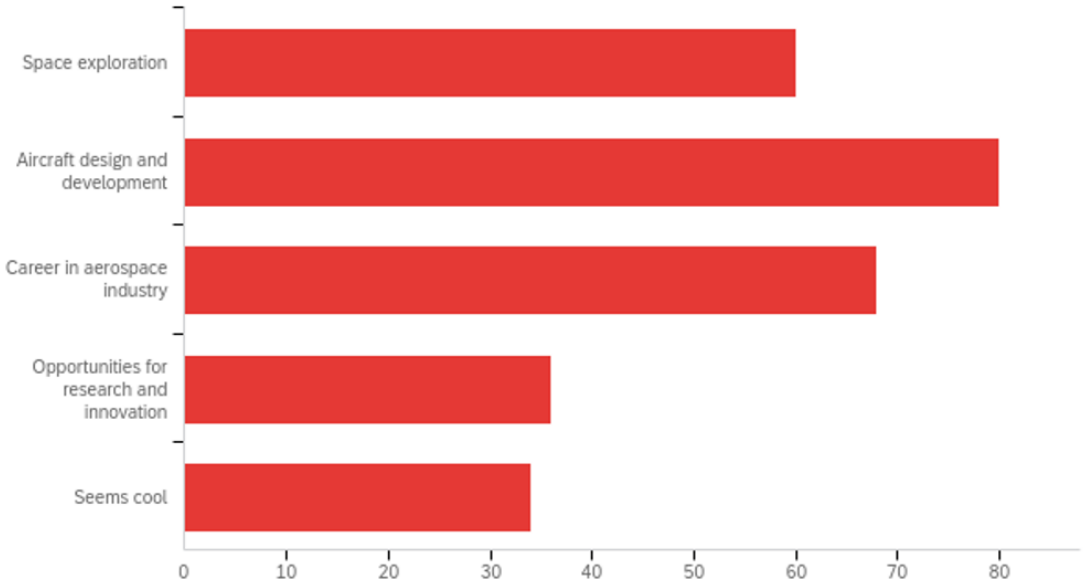

| # | Answer | % | Count |
|---|---|---|---|
| 1 | Mechanical Engineering | 54.39% | 155 |
| 2 | Electrical & Computer Engineering | 14.74% | 42 |
| 3 | Chemical and Biomedical Engineering | 12.63% | 36 |
| 4 | Industrial & Manufacturing Engineering | 3.16% | 9 |
| 5 | Civil and Environmental Engineering | 9.12% | 26 |
| 6 | Other (please specify): | 5.96% | 17 |
| | Total | 100% | 285 |

Q2 - On a scale of 1 to 5, how interested are you in pursuing graduate studies in aerospace engineering at FAMU-FSU COE?



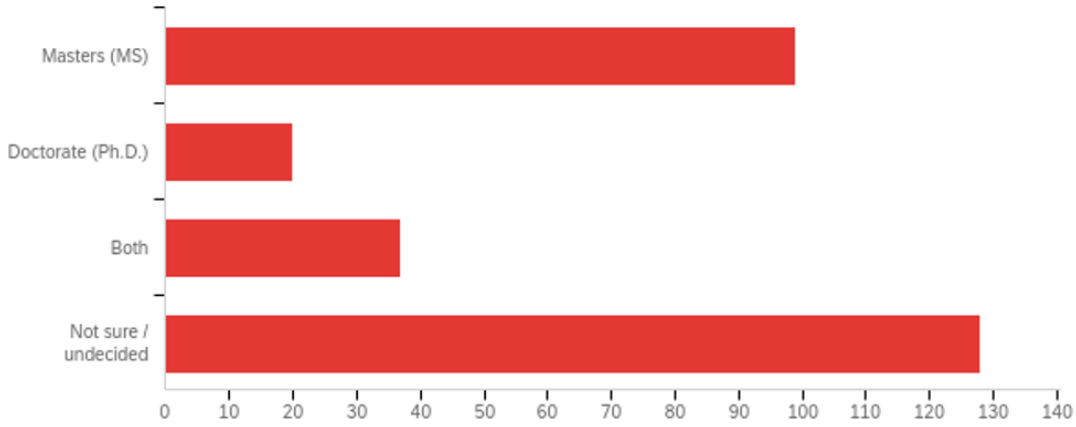

| # | Answer | % | Count |
|---|---|---|---|
| 1 | 1 – Not at all interested | 8.42% | 24 |
| 2 | 2 – Slightly interested | 11.23% | 32 |
| 3 | 3 – Moderately interested | 27.72% | 79 |
| 4 | 4 – Very Interested | 22.81% | 65 |
| 5 | 5 – Extremely interested | 29.82% | 85 |
| | Total | 100% | 285 |

Q3 - What motivates your interest in pursuing graduate studies in aerospace engineering?



| # | Answer | % | Count |
|---|---|---|---|
| 1 | Space exploration | 21.58% | 60 |
| 2 | Aircraft design and development | 28.78% | 80 |
| 3 | Career in aerospace industry | 24.46% | 68 |
| 4 | Opportunities for research and innovation | 12.95% | 36 |
| 5 | Seems cool | 12.23% | 34 |
| | Total | 100% | 278 |

Q4 - 4. Are you interested in Masters or Doctorate program at FAMU-FSU COE?




| # | Answer | % | Count |
|---|---|---|---|
| 1 | Masters (MS) | 34.86% | 99 |
| 2 | Doctorate (Ph.D.) | 7.04% | 20 |
| 3 | Both | 13.03% | 37 |
| 4 | Not sure / undecided | 45.07% | 128 |
| | Total | 100% | 284 |

**C. Complete Appendix A – Table 1 (1-A for undergraduate and 1-B for graduate) with projected student headcount (HC) and full-time equivalents (FTE).**

- **Undergraduate FTE must be calculated based on 30 credit hours per year**
- **Graduate FTE must be calculated based on 24 credit hours per year**

**In the space below, explain the enrollment projections. If students within the**

**institution are expected to change academic programs to enroll in the proposed program, describe the anticipated enrollment shifts and impact on enrollment in other programs.**

Year One

New students (PhD HC=6, FTE=6, MS HC=19, FTE=12) for the doctoral and masters programs are anticipated from graduates of the FAMU-FSU College of Engineering or related undergraduate programs at FAMU and FSU. After full implementation and development of marketing strategies, the program anticipates growing the program each year until it reaches approximately 24 PhD students (FTE=18) and 65 masters students (FTE=51) by year five. These estimates are based on five year historical numbers at the University of Florida and the University of Central Florida. With additional marketing efforts, the program may expand enrollment in the out years.

Year Two

New students (PhD HC=9, FTE=9, MS HC=34, FTE=26) for the doctoral and masters programs are anticipated from graduates of the FAMU-FSU College of Engineering or related undergraduate programs at FAMU and FSU. These students are largely distributed among: 1) Individuals who have recently graduated from preceding degree programs at this university, 2) Individuals who graduated from preceding degree programs at other Florida public universities, and 3) Individuals who graduated from preceding degree programs at non-public Florida institutions.

Year Three

New students (PhD HC=14, FTE=10, MS HC=48, FTE=37) for the doctoral and masters programs are anticipated from graduates of the FAMU-FSU College of Engineering or related undergraduate programs at FAMU and FSU. These students are largely distributed among: 1) Individuals who have recently graduated from preceding degree programs at this university, 2) Individuals who graduated from preceding degree programs at other Florida public universities, and 3) Individuals who graduated from preceding degree programs at non-public Florida institutions.

Year Four

New students (PhD HC=20, FTE=16, MS HC=63, FTE=53) for the doctoral and masters programs are anticipated from graduates of the FAMU-FSU College of Engineering or related undergraduate programs at FAMU and FSU. These students are largely distributed among: 1) Individuals who have recently graduated from preceding degree programs at this university, 2) Individuals who graduated from preceding degree programs at other Florida public universities, and 3) Individuals who graduated from preceding degree programs at non-public Florida institutions.

Year Five

New students (PhD HC=24, FTE=18, MS HC=65, FTE=51) for the doctoral and masters programs are anticipated from graduates of the FAMU-FSU College of Engineering or related undergraduate programs at FAMU and FSU. These students are largely distributed among: 1) Individuals who have recently graduated from preceding degree

programs at this university, 2) Individuals who graduated from preceding degree programs at other Florida public universities, and 3) Individuals who graduated from preceding degree programs at non-public Florida institutions.

**D. Describe the anticipated benefits of the proposed program to the university, local community, and the state. The benefits of the program should be described both quantitatively and qualitatively.**

Anticipated benefits of introducing a program in aerospace engineering are extensive, promising numerous advantages for FAMU, FSU, the Panhandle region, the State of Florida, and the nation. These encompass the following:

- Create avenues for recruiting students interested in pursuing Aerospace Engineering and establish an educational framework for them to obtain a graduate degree.
- Leverage significant investments from FAMU and FSU in start-up packages and infrastructure support for faculty researching emerging fields.
- Introduce a cost-effective STEM program.
- Enhance research visibility for the FAMU-FSU College of Engineering.
- Expand opportunities for FAMU and FSU to secure more substantial funding for aerospace research, especially interdisciplinary grants.
- Address the pressing educational need to produce more engineers in the U.S. and Florida, particularly in aerospace.

Contribute to research, economic development, and job creation in the Panhandle region and across the State.

- Enhance the Nation's technical capability by attracting researchers and supporting new product development.
- Assist in overcoming the underrepresentation of minorities in STEM, particularly in engineering. The FAMU-FSU College of Engineering has demonstrated progress in this area, ranking fourth nationally in producing PhDs for African Americans.

**E. If other public or private institutions in Florida have similar programs at the four- or six-digit CIP Code or in other CIP Codes where 60 percent of the coursework is comparable, identify the institution(s) and geographic location(s). Summarize the outcome(s) of communication with appropriate personnel (e.g., department chairs, program coordinators, deans) at those institutions regarding the potential impact on their enrollment and opportunities for possible collaboration in the areas of instruction and research.**

Two programs in the State of Florida have Aerospace Engineering graduate programs - the University of Florida and the University of Central Florida. The Chair, William S. Oates, has spoken to both department chairs at these universities to discuss potential impact and collaboration opportunities with these existing programs; see Appendix B.

**F. If the proposed program substantially duplicates a program at Florida Agricultural and Mechanical University (FAMU), a letter of support from FAMU must be provided. The letter must address whether the proposed program may adversely affect FAMU's ability to achieve or maintain student diversity in its existing program. The institution's Equal Opportunity Officer shall review this section of the proposal, sign, and date the additional signature page to indicate that all requirements of this section have been completed.**

There is currently no Aerospace Engineering program offered through the FAMU-FSU College of Engineering. FAMU offers undergraduate Architecture and Engineering Technology degrees; however, these programs are distinctly different from aerospace engineering.

## IV. Curriculum

**A. Describe all admission standards and all graduation requirements for the program. Hyperlinks to institutional websites may be used to supplement the information provided in this subsection; however, these links may not serve as a standalone response. For graduation requirements, describe any additional requirements that do not appear in the program of study (e.g., milestones, academic engagement, publication requirements).**

### Master's Program

Prospective students must have a BS degree (or a recognized equivalent) in Mechanical or Aerospace Engineering or any one of the following related fields: Any Engineering Major, Chemistry, Computer Science, Materials Science, Mathematics/Applied Mathematics, or Physics/Applied Physics. Non-majors, students without a BS degree in Mechanical Engineering, may be required to take up to twelve credit hours of remedial coursework in Mechanical Engineering as a condition of admission.

Applicants must have at least a 3.0 upper-division GPA and GRE General Exam scores or an approved GRE waiver. International students must take the TOEFL exam and score at least 550 on the paper-based exam, 213 on the computer-based exam, or 80 on the Internet-based exam. Other acceptable English Language Proficiency Exam scores are as follows: Pearson Test in English (50), Duolingo (120), Cambridge C1 Advanced Level (180), and Michigan Language Assessment (55). Applicants must also submit a personal/research statement, résumé, and three letters of recommendation. Please visit the department website for additional details: https://eng.famu.fsu.edu/me.

*Note:* Effective August 2011, the GRE Revised General Test replaced the GRE General Test. To learn more about this test, go to https://ets.org/gre.

### Ph.D. Program

Prospective students must have an MS degree in Mechanical or Aerospace Engineering or any one of the following related fields: any Engineering Major, Chemistry, Computer Science, Materials Science, Mathematics/Applied Mathematics, or Physics/Applied Physics. Non-majors, students without a BS degree in Mechanical or Aerospace

Engineering, may be required to take up to 12 credit hours of remedial coursework in Mechanical Engineering as a condition of admission.

Applicants must have at least a 3.0 upper-division GPA and GRE General Exam scores or an approved GRE waiver. International students must take the TOEFL Exam and score at least 550 on the paper-based exam, 213 on the computer-based exam, or 80 on the Internet-based exam. Other acceptable English Language Proficiency Exam scores are as follows: Pearson Test in English (50), Duolingo (120), Cambridge C1 Advanced Level (180), and Michigan Language Assessment (55). Applicants must also submit a personal statement, résumé, and three letters of recommendation. Please visit the department website for additional details: https://eng.famu.fsu.edu/me.

*Note:* Effective August 2011, the GRE Revised General Test replaced the GRE General Test. To learn more about this test, go to https://ets.org/gre.

**BS to PhD Program**

In addition to the standard PhD program the department offers a direct BS to PhD program. This program is limited to students with excellent academic transcripts and demonstrated potential for advanced research. Applicants must submit strong letters of recommendation from professors or persons qualified to evaluate their academic potential. Admission to the program is finalized at the end of the second semester. During their first two semesters, students must maintain a minimum graduate GPA of 3.50. Final admission to the PhD program is granted by the Graduate Committee.

Students initially admitted to the master's program may request a transfer to the BS-PhD program at the end of their second semester. The student must have maintained a graduate GPA of 3.50 or better during their first two semesters.

**B. Describe the specific expected student learning outcomes associated with the proposed program and include strategies for assessing the proposed program's learning outcomes. If the proposed program is a baccalaureate degree, include a hyperlink to the published Academic Learning Compact and the document itself as Appendix C.**

Institutional Effectiveness (IE) for Aerospace Engineering – PhD

- Program Outcome (PO) Name: Time to Degree
  - PO Statement: Doctoral students will progress in the Aerospace Engineering program at adequate pace.
  - PO Assessment Plan: For this PO, we will track how many of our doctoral students progress from matriculation to graduation within five years, which is the expected program duration. To calculate the completion rate, we will take the number of students who earn their doctorate in a given academic year (defined as Summer, Fall, Spring) and divide it by the total number of students in the original cohort from five years ago (Summer, Fall, Spring). This

performance objective will be assessed by official FAMU-FSU College of Engineering enrollment and graduation statistics.
    - PO Numeric Target: At least 80% of doctoral students in a cohort will graduate with their doctorate in Aerospace Engineering within 5 years from the matriculation year.

- Student Learning Outcome (SLO) Name: Oral Communication and Presentation Skills
    - SLO Statement: Upon completion of the course of instruction, the student will communicate effectively through oral and visual means.
    - SLO Assessment Plan: PhD committees are formed with a minimum of four members (chair, university representative, member in-area, member-out of area). The university representative is outside of the department. The student's adviser will gather completed rubrics, securely store them, and compile the scores for the annual assessment report. The 'Oral Communication and Presentation Skills' are evaluated based on whether: The dissertation defense was presented using a clear and logical structure, engaging delivery, appropriate voice, and effective visuals, and with evidence of prior rehearsal. The 'Oral Communication and Presentation Skills' are evaluated based on a 4-point scale: Exemplary (4 Points), Proficient (3 Points), Acceptable (2 Points), Deficient (1 Point).
    - SLO Numeric Target: At least 80% of students will achieve level of 'Exemplary' (4 points) or 'Proficient' (3 points) on the rubric criterion 'Oral Communication and Presentation Skills' from all committee members.

- Student Learning Outcome (SLO) Name: Research Skills
    - SLO Statement: Students will review literature, apply research methodologies, and analyze and interpret data and results.
    - SLO Assessment Plan: The 'Research Skills' are evaluated based on three criteria (each one is evaluated separately as a distinct criterion in the corresponding rubric). 'Literature Review' criterion: The student exhibits a thorough and comprehensive understanding of the research topic, providing a critical examination of relevant literature. 'Methodology' criterion: Thorough, clear, and well-justified, covering research design, data collection, and analysis comprehensively. 'Results and Discussion' criterion: Clear, accurate, and comprehensive, addressing the research question with appropriate data and analysis. Insightful, coherent, and well-structured interpretation of results. Addresses study's applications, limitations, and contributions. The three criteria falling under 'Research Skills' are evaluated based on a 4-point scale: Exemplary (4 Points), Proficient (3 Points), Acceptable (2 Points), Deficient (1 Point).
    - SLO Numeric Target: At least 80% of students will achieve level of 'Exemplary' (4 points) or 'Proficient' (3 points) on all three rubric criteria that fall under the

'Research Skills' umbrella (Literature review, methodology, and results and discussion) from all committee members.

Institutional Effectiveness (IE) for Aerospace Engineering – MS

- Program Outcome (PO) Name: Time to Degree
  - PO Statement: Master's students will progress in the Aerospace Engineering program at adequate pace.
  - PO Assessment Plan: For this PO, we will track how many of our master's students progress from matriculation to graduation within two years, which is the expected program duration. To calculate the completion rate, we will take the number of students who earn their master's in a given academic year (defined as Summer, Fall, Spring) and divide it by the total number of students in the original cohort from two years ago (Summer, Fall, Spring). This performance objective will be assessed by official FAMU-FSU College of Engineering enrollment and graduation statistics.
  - PO Numeric Target: At least 80% of master's students in a cohort will graduate with their MS in Aerospace Engineering within 2 years from the matriculation year.

- Student Learning Outcome (SLO) Name: Oral Communication and Presentation Skills
  - SLO Statement: Upon completion of the course of instruction, the student will communicate effectively through oral and visual means.
  - SLO Assessment Plan: For non-thesis students, we will employ a rubric for their project presentation in EAS 5102. For thesis students, we will utilize the same rubric for their thesis defense.
    - *Non-Thesis Students:* The 'Oral Communication and Presentation Skills' are evaluated based on whether: Design project presentation in the required course (EAS 5102 Fundamentals of Aerodynamics) has a clear and logical structure, engaging delivery, appropriate voice and effective visuals, and evidence of rehearsal. The 'Oral Communication and Presentation Skills' are evaluated based on a 4-point scale: Exemplary (4 Points), Proficient (3 Points), Acceptable (2 Points), Deficient (1 Point). The course instructor will gather completed rubrics, securely store them, and compile the scores for the annual assessment report.
    - *Thesis Students:* MS (Master's) committees are formed with a minimum of three members (chair, member in-area, member-out of area). The student's adviser will gather completed rubrics, securely store them, and compile the scores for the annual assessment report. The 'Oral Communication and Presentation Skills' are evaluated based on whether: The thesis defense has a clear and logical structure, engaging delivery, appropriate voice and effective visuals, and evidence of rehearsal. The 'Oral Communication and Presentation Skills' are

evaluated based on a 4-point scale: Exemplary (4 Points), Proficient (3 Points), Acceptable (2 Points), Deficient (1 Point).

- SLO Numeric Target: At least 80% of students will achieve level of 'Exemplary' (4 points) or 'Proficient' (3 points) on the rubric criterion 'Oral Communication and Presentation Skills'.

- Student Learning Outcome (SLO) Name: Review of Applicable Theories and Literature
  - SLO Statement: Students will demonstrate broad knowledge of disciplinary fundamentals.
  - SLO Assessment Plan: For non-thesis students, we will employ a rubric for their project presentation in EAS 5102. For thesis students, we will utilize the same rubric for their thesis defense.
    - *Non-Thesis Students:* The 'Literature Review' are evaluated based on: A class (EAS 5102 Fundamentals of Aerodynamics) project to evaluate a student's understanding of essential concepts, theories, and foundational principles within the discipline. The 'Literature Review' are evaluated based on a 4-point scale: Exemplary (4 Points), Proficient (3 Points), Acceptable (2 Points), Deficient (1 Point). The course instructor will gather completed rubrics, securely store them, and compile the scores for the annual assessment report.
    - *Thesis Students:* MS (Master's) committees are formed with a minimum of three members (chair, member in-area, member-out of area). The student's adviser will gather completed rubrics, securely store them, and compile the scores for the annual assessment report. The 'Literature Review' are evaluated based on: The student exhibits a thorough and comprehensive understanding of the research topic, providing a critical examination of relevant literature. The 'Literature Review' are evaluated based on a 4-point scale: Exemplary (4 Points), Proficient (3 Points), Acceptable (2 Points), Deficient (1 Point).
  - SLO Numeric Target: At least 80% of students will achieve level of 'Exemplary' (4 points) or 'Proficient' (3 points) on the rubric criterion 'Literature Review'.

**C. If the proposed program is an AS-to-BS capstone, provide evidence that it adheres to the guidelines approved by the Articulation Coordinating Committee for such programs, as outlined in State Board of Education Rule 6A-10.024. Additionally, list any prerequisites and identify the specific AS degrees that may transfer into the proposed program.**

☒ **Not applicable to this program because it is not an AS-to-BS Capstone.**

**D. Describe the curricular framework for the proposed program, including the following information where applicable:**

- **total number of semester credit hours for the degree**

- **number of credit hours for each course**
- **required courses, restricted electives, and unrestricted electives**
- **a sequenced course of study for all majors, concentrations, tracks, or areas of emphasis**

FAMU and FSU students will follow an identical curriculum. Throughout their Aerospace Engineering program, students will participate in the Interdisciplinary Seminar Series (0 credits). The curricular framework for MS and PhD programs is detailed below.

**Master's Program**

I. *Thesis Option*

Aerospace Engineering students must take the following minimum distribution of courses for a total of 30 credit hours:

**Core Courses**
**Nine credit hours:**

- EML 5060 Analysis in Mechanical Engineering, and
- Two core courses in the major area (either Dynamics and Controls, Fluid Mechanics and Heat Transfer, or Solid Mechanics and Materials Science)

**Core courses in Dynamics and Controls:**

- EGM 5444 Advanced Dynamics
- EML 5317 Advanced Design and Analysis of Control Systems
- EML 5361 Multivariable Control
- EML 5930r Special Topics in Mechanical Engineering

**Core courses in Fluid Mechanics and Heat Transfer:**

- EML 5152 Fundamentals of Heat Transfer
- EML 5155 Convective Heat and Mass Transfer
- EML 5709 Fluid Mechanics Principles with Selected Applications
- EML 5930r Special Topics in Mechanical Engineering

**Core courses in Solid Mechanics and Materials Science:**

- EGM 5611 Introduction to Continuum Mechanics
- EML 5930r Special Topics in Mechanical Engineering

**Aerospace Engineering Courses**

- Six credit hours: two courses in Aerospace Engineering.

**Electives**
**Nine credit hours:**

- Select three graduate-level courses in any engineering field, mathematics, or any

science discipline (computer science, physics, etc.).
- Courses must be selected in consultation with the student's major professor.
- One of the three electives may include EML 5905 Directed Individual Study or EML 5910 Supervised Research.

**Thesis**
**Six credit hours:**

- EML 5971 Thesis, and
- EML 8976 Master's Thesis Defense

*II. Non-Thesis Option*

The non-thesis option requires 30 credit hours, of which at least 27 credit hours must be letter-graded courses. Students must complete 21 credit hours of coursework within aerospace or mechanical engineering. Nine credit hours may be taken outside the department in any of the following areas: engineering, mathematics, or any science discipline (computer science, physics, etc.).

**Ph.D. Program**

The standard PhD program requires 48 credit hours of coursework, of which at least 24 credit hours must be dissertation hours. The remaining letter-graded credit hours are divided into three areas:

**General Engineering and Mathematics**

Students must complete six credit hours of general engineering and advanced mathematics courses. One of those courses must be EML 5061 Analysis in Mechanical Engineering II. The remaining course must be from the approved course list. See the department website for the approval list.

**Electives**

Students must complete 18 credit hours of graduate-level, letter-graded electives. Courses may be taken in any engineering program, mathematics, and/or any science discipline.

**BS to PhD Program**

The BS-PhD program requires 60 credit hours of coursework, of which at least 24 credit hours must be dissertation hours. The remaining 36 letter-graded credit hours are divided into five areas:

**General Engineering and Mathematics**

Students must complete 9 credit hours of general engineering and advanced mathematics courses at the 5000 or higher level. One of those courses must be EML 5061 Analysis in Mechanical Engineering II. The remaining course must be from the approved course list. See the department website for the approval list.

**Core Courses**

Students must complete EML 5060 Analysis in Mechanical Engineering I and two courses

in their chosen depth area for 9 semester hours.

**Aerospace Engineering Courses**

Students must complete 6 credit hours of general aerospace-engineering courses.

**Electives**

Students must complete 12 credit hours of electives. Courses may be taken in any engineering program, mathematics, and/or any science discipline. Students may substitute one elective course with a Directed Individual Study (DIS) course or Supervised Research (SR) course.

**Additional Requirements**

**Preliminary Examination**

All PhD students must register for and pass EML 8968 (Preliminary Examination) before their fourth semester ends. The exam is designed to evaluate a student's grasp of a specified spectrum of Aerospace Engineering (at the undergraduate level) and their ability to think creatively. It consists of an oral examination following a written research proposal and is administered each term. After passing the exam, the student will be granted doctoral candidacy status, allowing them to register for dissertation credit hours.

**Prospectus Defense**

Within one year of obtaining candidacy status each PhD student must present a prospectus to their committee on a research project suitable for a doctoral dissertation. A forty-five-minute presentation of the proposed dissertation topic will be presented to the students' graduate committee for approval.

**Dissertation Defense**

Demonstrated ability to perform original research at the forefront of mechanical engineering is the final and major criterion for granting the doctoral degree. The candidate's dissertation serves, in part, to demonstrate such competence; on completion it is defended orally in a public seminar before the doctoral dissertation committee, which may then recommend the awarding of the degree.

**E. Provide a brief description for each course in the proposed curriculum.**

Below is the brief description of courses for the proposed curriculum. The definition of the prefixes used are:

**EAS**—Aerospace Engineering

**EGM**—Engineering Science

**EGN**—Engineering: General

**EMA**—Materials Engineering

**EML**—Engineering: Mechanical

- **EAS 5102. Fundamentals of Aerodynamics (3)**. Prerequisites: EML 3015C and EML 3016C. This course includes fundamental fluid mechanics and aerodynamic principles in the design of airfoil and aircraft wings. The course provides a comprehensive review concerning applications, technological advances, and social impacts on the development of a modern flight vehicle.

- **EGM 5330. Random Data Measurement and Analysis (3)**. Prerequisite: Graduate standing or instructor permission. This course explores random data, mean values, mean-square values, probability density and distribution functions, moments and characteristic functions, spectral and correlation analysis; bias and random error estimates in data measurements; input-output system models; measurement examples.

- **EGM 5348. Introduction to Scientific and High-Performance Computing (4)**. Prerequisites: an understanding of linear algebra and knowledge of a programming language (C, C++, FORTRAN) or a scripting language (MATLAB, Python). This course covers fundamental concepts for scientific computing such as numerical solution methods, error analysis, and parallelization methodologies. Students explore essential tools and environments for high-performance computing and consider effective use of computational resources.

- **EGM 5444. Advanced Dynamics (3)**. Prerequisite: EGN 3321, EML 3220, and MAP 3306. In this course, topics include particle and rigid body kinematics, particle and rigid body kinetics, D'Alembert Principle, LaGrange's equations of motion, system stability, computational techniques, orbital dynamics, multi-body dynamics.

- **EGM 5611. Introduction to Continuum Mechanics (3)**. Prerequisite: Graduate standing. Solid and fluid continua. Cartesian tensor theory. Kinematics of infinitesimal deformation, relations between stress, strain, and strain rate for elastic, plastic, and viscous solids and for compressible and viscous fluids. General equations of continuum mechanics, integral forms, and their physical interpretation. Particular forms of equations and boundary conditions for elastic and viscoelastic solids and Newtonian fluids.

- **EGM 5612. Solid Mechanics and Electromagnetics of Continuous Media (3)**. Prerequisites: Familiarity with topics of strength of materials, concepts of stresses and strains, a basic understanding of thermodynamics and electromagnetics. This course introduces concepts of continuum thermo-mechanics and electromagnetics with application in solving field-coupled boundary value problems.

- **EGM 5810. Viscous Fluid Flows (3)**. Prerequisite: EML 5709. Presents the basic fundamentals underlying the mechanics of gas, air, and fluid flows. Discussion of the possible methods of estimating and predicting the characteristics and parameters governing those flows.

- **EGM 6845. Turbulent Flows (3)**. Prerequisite: EML 5709. In-depth study of turbulent, flows, statistical description of turbulence; instability and transition; turbulence closure modeling; free shear and boundary layer flows; complex shear flows; development of computational strategies; recent literature on applications and chaos phenomena.

- **EMA 5226. Mechanical Metallurgy (3)**. Prerequisites: EML 3234. Tensile instability,

crystallography, theory of dislocations, plasticity, hardening mechanisms, creep and fracture, electron microscopy, composite materials.

- **EMA 5514. Electron Microscopy (3)**. Prerequisite: Instructor permission. This course focuses on fundamentals and techniques of electron microscopy as applied to the determination of physical, chemical, and structural properties of materials and materials behavior in practice.

- **EMA 5814. Computational Material Physics (3)**. This course covers numerical simulation techniques for predicting various physical properties of conventional materials, nanomaterials, and biomaterials. Students use computational material physics tools to understand, predict, and design new materials and guide experimental studies at the atomistic level.

- **EML 5042. Modeling and Simulation of Mechanical Systems (3)**. Prerequisites: EML 3014C, EML 3018C, or instructor permission. This course is an introduction to various concepts of modeling and simulation of mechanical systems, including models of systems, numerical solutions of ODEs, software tools for modeling and simulation of complex mechanical systems.

- **EML 5045. Manufacturing Processes Control (3)**. Prerequisites: EML 3234 and EML 3012C. Corequisites: EML 4312 or EML 5311. This course introduces essential knowledge in the control of manufacturing systems and processes.

- **EML 5060. Analysis in Mechanical Engineering (3)**. Prerequisite: Graduate standing in mechanical engineering. Familiarizes the student with methods of analysis in mechanical engineering. Surveys applications of integration and series, ordinary and partial differential equations, and linear algebra.

- **EML 5061. Analysis in Mechanical Engineering II (3)**. Prerequisite: EML 5060 or equivalent. This course familiarizes students with applications of vector calculus and partial differential equations in mechanical engineering.

- **EML 5072. Applied Superconductivity (3)**. Prerequisites: EEL 3472; EML 3100; EML 3234; PHY 3101. Introduction to superconductivity for applications, fundamentals of the superconducting state, transport current and metallurgy of superconductors, Superconducting electrons and magnets, system engineering.

- **EML 5103. Advanced Engineering Thermodynamics (3)**. Prerequisite: Graduate standing in mechanical engineering. This course in thermal fluids covers the axiomatic formulations of the first and second laws of thermodynamics; general thermodynamic relationships and properties of real substances; energy, exergy, and second-law analysis of energy-conversion processes; reactive systems and multiphase equilibrium; entropy generation minimization and thermodynamic optimization; as well as applications to low-temperature refrigeration and power-generation systems.

- **EML 5152. Fundamentals of Heat Transfer (3)**. Prerequisite: Graduate standing in mechanical engineering. This is an introductory course in basic heat transfer concepts. Topics include conduction and heat diffusion equation, forced and free convection, radiative heat transfer, boiling heat transfer, and condensation.

- **EML 5155. Convective Heat and Mass Transfer (3)**. Prerequisites: EGM 5810; EML 5152. Familiarizes the student with methods to evaluate a convection heat transfer coefficient and a mass transfer coefficient for a variety of engineering applications. Evaluation of the driving force in mass transfer and combined problems.

- **EML 5162. Cryogenics (3)**. Prerequisites: EML 3015C, EML 3016, and EML 3234. Miscellaneous requirement: EML 4512 and PHY 3101 are recommended. This course focuses on the fundamental aspects of cryogenics system and engineering properties of materials and fluids at low temperatures; cryogenic heat transfer and fluid dynamics, low temperature refrigeration and system engineering.

- **EML 5224. Acoustics (3)**. Prerequisites: EML 3015C, EML 3016C. Corequisite: EML 5710. This course provides an introduction to physical acoustics with an emphasis on a thermal-fluids perspective.

- **EML 5289. Vehicle Design (3)**. Prerequisites: EML 3014C and EML 3018C, or instructor permission. This is an introductory course in vehicle design concentrating primarily on vehicle dynamics. Students examine the key features of vehicle design that relate to performance: suspension, steering, chassis, and tires. By using the latest in industry standard software, students consider the various design parameters influencing vehicle performance and handling.

- **EML 5311. Design and Analysis of Control Systems (3)**. Prerequisite: MAP 3306. Mathematical modeling of continuous physical systems. Frequency and time domain analysis and design of control systems. State variable representations of physical systems.

- **EML 5317. Advanced Design and Analysis of Control Systems (3)**. Design of advanced control systems (using time and frequency domains) will be emphasized. Implementation of control systems using continuous (operational amplifier) or digital (microprocessor) techniques will be addressed and practiced.

- **EML 5361. Multivariable Control (3)**. Prerequisite: EML 4312 or 5311. Course covers H2 and H control design for linear systems with multiple inputs and multiple outputs and globally optimal techniques, fixed-structure (e.g., reduced-order) techniques. Includes introductory concepts in robust control.

- **EML 5422. Fundamentals of Propulsions Systems (3)**. Prerequisite: EML 3015C, EML 3016C, and graduate standing in mechanical engineering. This course offers an analysis of the performance of propulsion systems using fundamental principles of thermodynamics, heat transfer, and fluid mechanics. Systems studied include turbojet, turbofan, ramjet engines, as well as piston-type internal combustion engines.

- **EML 5451. Energy Conversion Systems for Sustainability (3)**. Prerequisites: Requires graduate standing. This course discusses the challenge of making the global energy system independent of finite fossil-energy sources and, instead, dependent on environmentally sustainable energy sources. The course emphasizes strategies for producing energy that is free of greenhouse-gas emissions, including renewable energy sources such as solar, wind, and biomass. The course focuses on direct energy conversion and covers topics such as photovoltaic cells, fuel cells, and thermoelectric systems.

- **EML 5453. Sustainable Power Generation (3)**. Prerequisites: EML 4450 or EML 5451 or graduate student standing in engineering or sciences. This course is a continuation of sustainability energy-conversion systems and focuses on solar electricity, biopower, biofuels, and hydrogen. The course also discusses the practicality of hydrogen-based transportation.

- **EML 5525. Design and Modeling for Manufacturing Processes (3)**. Prerequisites: EML 3012C and EML 3018C. This course covers descriptive and analytical treatment of manufacturing processes and production equipment, automation, as well as applications of mechanics stress analysis, vibrations, heat transfer. The course includes discrete time simulation.

- **EML 5537. Design Using FEM (3)**. The Finite Element Method - what it is, elementary FEM theory, structures and elements, trusses, beams, and frames, two-dimensional solids, three-dimensional solids, axisymmetric solids, thin-walled structures, static and dynamic problems, available hardware and software, basic steps in FEM analysis, pre/post processing, interpretation of results, advanced modeling techniques, design optimization, advanced materials using FEM.

- **EML 5543. Materials Selection in Design (3)**. Prerequisite: EML 3234 or equivalent. This course examines the application of materials predicated on material science and engineering case studies covering most engineering applications.

- **EML 5705. Active Flow Control (3)**. Prerequisites: EML 3014C (or an equivalent undergraduate controls course) and EML 5709. This course covers active flow control. Active flow control is a rapidly emerging field of significant technological importance to the design and capability of a new generation of fluid systems, spawning major research initiatives in government industry, and academic sectors.

- **EML 5709. Fluid Mechanic Principles with Selected Applications (3)**. Prerequisites: Graduate standing in mechanical engineering, EML 3015, and EML 5060 (or other course equivalents). This course explores introductory concepts, description, and kinematical concepts of fluid motion, basic field equations, thermodynamics of fluid flow, Navier-Stokes equations, elements of the effects of friction and heat flow, unsteady one-dimensional motion, selected nonlinear steady flows.

- **EML 5710. Introduction to Gas Dynamics (3)**. Prerequisite EML 3016C. This course concentrates on the unique features of compressibility in fluid mechanics. It provides the student with knowledge and understanding of the fundamentals of compressible fluid flow and is basic to studies in high-speed aerodynamics, propulsion, and turbomachinery.

- **EML 5725. Introduction to Computational Fluid Dynamics (3)**. Prerequisite: EML 5709. Topics for this course include introduction to conservation laws in fluid dynamics; weak solutions; solving the full potential equations for subsonic, transonic, and supersonic flows; solving system of equations. In particular, upwind schemes and flux splitting will be introduced in solving the Euler equations. Coordinate transformation and grid generation methods will also be covered.

- **EML 5802. Introduction to Robotics (3)**. Prerequisite: Graduate standing in

mechanical engineering. This course studies the fundamentals of robot operation and application including basic elements, robot actuators and servo-control, sensors, senses, vision, voice, microprocessor system design and computers, kinematic equations, and motion trajectories.

- **EML 5803. Mechatronics II (3)**. This course focuses on developing greater competence in the application of electromechanical components to solve engineering problems and build 'smart' systems. The course focuses on the design interplay between electrical and mechanical systems. Students use microprocessors, circuits, sensors, and actuators in both labs and projects to develop multi-purpose electromechanical devices. The course provides instruction and practical exercises in programming, electronics, signal conditioning, communication protocols, mechanical design, prototyping techniques, and system integration.

- **EML 5831. Introduction to Mobile Robotics (2)**. Prerequisite: EML 3811 and EML 3811L or instructor permission. Corequisite: EML 5831L. This course examines kinematic modeling and simulation of mobile robots; mobile robot sensors; fundamental methods of computer vision; Kalman filtering and mobile robot localization; SLAM; path, trajectory planning, and obstacle avoidance; intelligent control architectures; and advanced topics in localization, mapping, and motion planning.

- **EML 5831L. Mobile Robotics Lab (1)** Prerequisite: EML 3811 and EML 3811L or instructor permission. Corequisite: EML 5831. This course offers a hands-on implementation of core and advanced mobile robotics algorithms. In addition, it introduces widely used mobile robotics software packages.

- **EML 5832. Bio/Robotic Locomotion (3)**. Prerequisite: Permission of Instructor. This course introduces the fundamental concepts for biological and robotic locomotion with limbs. Muscular-skeletal biomechanics for vertebrate and invertebrate animals are briefly reviewed including an overview of the function of muscles. Morphology, gaits, posture, and the effect of scale on legged locomotion are discussed. The history of legged robots is reviewed. Reduced-order dynamic models of walking and running are introduced. Techniques for analyzing the stability of these periodic hybrid-dynamic systems are covered. The course includes the development and analysis of simulation and hardware platforms of locomotion systems.

- **EML 5930 : Introduction to Bayesian Uncertainty Analysis for Engineers**: This course will introduce students to Bayesian uncertainty analysis in engineering problems. It will compare Bayesian statistics to frequentist statistics. A tutorial based lecture series will be utilized to provide students with hands-on experience computing uncertainty of models in light of data. Matlab code will be provided.

- **EGM 5653 - Theory of Elasticity:** *Prerequisite: EGM 5611.* This is an introductory course which provides background necessary to mechanical engineers who wish to pursue the area of theoretical or analytical solid mechanics. Topics include Cartesian tensors, kinetics and kinematics of motion, constitutive equations, linearized theory of elasticity, and solutions to boundary value problems.

- **EML 5930 Introduction to Hypersonic Flows:** This course is a technical elective course designed for graduate level engineering students in the Aeronautics Track and

area of thermal and fluid sciences. The course includes fundamental of hypersonic aerodynamics and aerothermodynamics. It provides a comprehensive review concerning applications, technological advances, and social impacts on the development of a modern hypersonic flight vehicle. The course provides an overview of the guiding principles, compressible flow simulations and experimental observations to understand hypersonic flows.

- **EML 5905r. Directed Individual Study (1–9)**. (S/U grade only). Instructor permission required. Individual study topics are determined by the instructor and student. May be repeated to a maximum of forty-five semester hours.

- **EML 5910r. Supervised Research (1–5)**. (S/U grade only). A maximum of three semester hours may apply to the master's degree. May be repeated to a maximum of five semester hours.

- **EML 5930r. Special Topics in Mechanical Engineering (1–6)**. Prerequisite: Instructor permission. This course explores various topics in mechanical engineering with emphasis on recent developments. Content and credit will vary. Consult the instructor.

- **EML 5935r. Mechanical Engineering Seminars (0)**. (S/U grade only). May be repeated to a maximum of ten times.

- **EML 5946. Professional Internship Experience in Mechanical Engineering (4)**. This course provides practical experience through working as an intern at selected industry or research laboratories supervised by the on-the-job mentors and by the Department of Mechanical Engineering. The course is designed to provide the student with professional internship experience in preparation for his/her future career development.

- **EML 5955r. MS Professional Traineeship Project (3–6)**. Prerequisite: B.S. degree in Mechanical Engineering (or a related field) and EML 5946. In this two-semester course, students work on practice-oriented engineering design or research development project defined by industry or research laboratories to partially fulfill graduation requirements for the BS-MS professional Traineeship degree.

- **EML 5971r. Master's Thesis Research (1-12.)** (S/U grade only). This course provides a means of registering for thesis research work and recording progress towards its completion. Student must consult with the academic department for appropriate registration of course credit hours. May be repeated to a maximum of forty-five (45) credit hours; repeatable within the same term.

- **EML 6365. Robust Control (3)**. Prerequisite: EML 5361. Course covers control design for systems with uncertain dynamics; robust H design, structured singular value synthesis; LMI and Riccati equation solution techniques.

- **EML 6980r. Dissertation (2–9)**. (S/U grade only). May be repeated to a maximum of ninety-nine semester hours.

- **EML 8968. Preliminary Doctoral Examination (0)**. (P/F grade only.)

- **EML 8976r. Master's Thesis Defense (0)**. (P/F grade only.)

- **EML 8985r. Dissertation Defense (0)**. (P/F grade only.) May be repeated to a maximum of three times.

The following is a list of new courses that will be developed over the first five years of the program. This list complements existing Mechanical Engineering courses to include additional topics important to aerospace engineering such as rotary wing systems, space applications, structural dynamics, and control.

- **Rotary Wing Aerodynamics:** This course covers vortex wake modeling, analytical inflow theories. Modern computational methods for rotary wing aerodynamic analysis. Aerodynamic Noise.

- **Structural Dynamics:** This course includes modeling of discrete systems; review of linear system theory, mathematical modeling of single-degree-of-freedom (SDOF) systems, viscous damping; structural damping; coulomb damping, Laplace transforms; Harmonic balance; Fourier series; Fourier integral; convolution integral; Duhamel's integral; work, energy, and Lagrange's equations, matrix eigenvalue problems; nature of modes; response of multi-degree-of-freedom systems by modal decoupling; rigid-body modes; stability; Hamilton's principle and calculus of variations, extension and torsion of rods; bending vibration of Euler-Bernoulli beams; bending-shear vibration of Timoshenko beams; beams with axial force, rotating beams; membranes and plates

- **Orbital Mechanics:** First graduate-level astrodynamics class that includes two-body orbital mechanics, orbit determination, orbit prediction, orbital maneuvers, lunar and interplanetary trajectories, orbital rendezvous and space navigation.

- **Planetary Entry, Descent and Landing:** This is a graduate-level elective that provides an integrated overview of planetary entry systems. The course content includes vehicle systems and definition, entry flight mechanics and dynamics, aerothermodynamics and thermal protection systems, aerodynamic decelerators and landing systems, and case studies based on recent robotic and human exploration mission concepts.

- **Introduction to System of Systems Engineering Principles:** This course covers methods related to the study, development, analysis, and design of complex systems and systems of systems. Lectures will cover each method by introducing its theoretical formulation, application criteria, and some example applications. The goal of the course is not to provide comprehensive coverage of each method, but to provide sufficient fundamental coverage of it to allow for the practical use of the methods on the group project.

- **Aerospace Nonlinear Control**: This course covers topics including Dynamical Systems and Differential Equations, Nonlinear Second-Order Dynamical Systems, Stability Theory for Nonlinear Dynamical Systems, Dissipative Theory for Nonlinear Dynamical Systems, Absolute Stability Theory, Input-Output Stability, Nonlinear Control.

- **Fundamentals of Fracture Mechanics**: This course is an advanced study of failure of structural materials under load, mechanics of fracture, and microscopic and macroscopic aspects of the fracture of engineering materials.

- **Composite Materials**: This course is an initial exposure to composite materials. It focuses on how heterogeneity/anisotropy in composites influence thermomechanical behavior. The behavior of both continuous and short fiber reinforced composites will be emphasized. Stress analysis for design, manufacturing processes and test methods of composite materials will be covered.

**F. For degree programs in medicine, nursing, and/or allied health sciences, identify the courses with the competencies necessary to meet the requirements in Section 1004.08, Florida Statutes. For teacher preparation programs, identify the courses with the competencies required in Section 1004.04, Florida Statutes.**

☒ **Not applicable to this program because the program is not a medicine, nursing, allied health sciences, or teacher preparation program.**

**G. Describe any potential impact on related academic programs or departments, such as an increased need for general education or common prerequisite courses or an increased need for required or elective courses outside of the proposed academic program. If the proposed program is a collaborative effort between multiple academic departments, colleges, or schools within the institution, provide letters of support or MOUs from each department, college, or school in Appendix D.**

As a graduate program, general education courses will be minimal; however, a strong mathematical background is required to understand fluid dynamics, nonlinear solid mechanics, and computational materials science. The Department of Mechanical Engineering has a long track record of working with several faculty within FSU's Mathematics Department. This has continued up to the present day through Mechanical Engineering seminars from faculty within the Math Department and meetings between faculty from Mechanical Engineering and Mathematics to build research partnerships. In certain instances, graduate students will take mathematics courses to supplement AE courses. This may be required to build a deeper understanding of numerical methods, interpret data with advanced statistics, machine learning algorithm development, and various other techniques to solve partial differential equations. We will continue to build these relationships to strengthen AE research via faculty collaborations and better educate our students with important mathematics courses.

**H. Identify any established or planned educational sites where the program will be offered or administered. Provide a rationale if the proposed program will only be offered or administered at a site(s) other than the main campus.**

This program will be offered as part of the FAMU-FSU College of Engineering in Tallahassee Florida. Students will take classes on the FAMU main campus, in the FAMU-FSU College of Engineering, and on the FSU main campus. Students will do their research where their advisor has their research labs on the FAMU main campus, in buildings in the FAMU-FSU College of Engineering, and in research buildings in Innovation Park (in Tallahassee).

**I. Describe the anticipated mode of delivery for the proposed program (e.g., face-to-face, distance learning, hybrid). If the method(s) of delivery will require specialized services or additional financial support, describe the projected**

**costs below and discuss how they are reflected in Appendix A – Table 3A or 3B.**

The courses will be delivered in the traditional face-to-face manner at the FAMU-FSU College of Engineering, FAMU main campus, or on the FSU campus as part of the cooperative agreement between the two universities.

**J. Provide a narrative addressing the feasibility of delivering the proposed program through collaboration with other institutions, both public and private. Cite any specific queries of other institutions concerning shared courses, distance/distributed learning technologies, and joint-use facilities for research or internships.**

The Ph.D. in Aerospace Engineering will be offered jointly between FAMU and FSU as part of the joint College. No more institutions will be involved in the course offerings now. Given the recent Triumph award in additive manufacturing and aerospace to the FSU Panama City Campus, expansions to include research at this facility will be considered once the infrastructure is developed.

**K. Describe any currently available sites for internship and/or practicum experiences. Describe any plans to seek additional sites in Years 1 through 5.**

**☒ Not applicable to this program because the program does not require internships or practicums.**

**V. Program Quality Indicators - Reviews and Accreditation**

**A. List all accreditation agencies and learned societies concerned with the proposed program. If the institution intends to seek specialized accreditation for the proposed program, as described in Board of Governors Regulation 3.006, provide a timeline for seeking specialized accreditation. If specialized accreditation will not be sought, please explain.**

The Aerospace Engineering undergraduate programs hold accreditation from ABET, the accrediting body for engineering programs. Notably, the FAMU-FSU College of Engineering lacks an undergraduate program in Aerospace Engineering. Additionally, it is important to note that there are no specific accreditation agencies for graduate programs (both M.S. and Ph.D.) in Aerospace Engineering.

**B. Identify all internal or external academic program reviews and/or accreditation visits for any degree programs related to the proposed program at the institution, including but not limited to programs within the academic unit(s) associated with the proposed degree program. List all recommendations from the reviews and summarize the institution's progress in implementing those recommendations.**

The FAMU-FSU Department of Mechanical Engineering underwent a Program Self-Study (Quality Enhancement Review—QER) in February of 2019. Key outcomes of the review and recommendations related to the graduate program are highlighted here. We also summarize progress since this review in implementing the QER recommendations. One overall goal that was included in the QER was to establish a nationally recognized graduate program with active recruitment strategies and excellent professional

preparation. Two of the objectives and strategies to achieve this goal included: 1) Develop an online degree program in Aeronautical Engineering through an asynchronous distance learning delivery system and 2) Establish new degree programs (MS and PhD) in the area of aerospace engineering. We have developed a distance learning aerospace certification program and now are aimed at establishing the AE graduate degree programs.

A broader assessment of the 2019 QER is given through three of the department's primary goals:

1. Establish a nationally recognized graduate program with active recruitment strategies and excellent professional preparation.

2. Expand our internationally-recognized research programs, especially in terms of interdisciplinary research collaborations and professional development.

3. Be recognized as one of the top ME programs in terms of educational innovations, outstanding research activities, and promotion of diversity.

With respect to aerospace engineering, we have made significant strides in all three of these goals.

Regarding item 1, we have developed active recruiting strategies that include Research Experiences for Undergraduates supported by the National Science Foundation (NSF) and the Department of Energy (DOE). This has led to two female SMART Fellows within our department. One of these students was the first FAMU SMART Fellow within our department. We have also begun actively recruiting US students at major conferences such as the AIAA SciTech conference which is the largest aerospace conference in the US. Our College of Engineering has provided financial support for these recruiting efforts. The department has also supported travel for FAMU faculty and students to attend the Black Engineer of the Year (BEYA) STEM Conference which includes ~12,000 attendees with 45% of these attendees being college students. Faculty within the ME Department have also been more active on social media (i.e., LinkedIn) to highlight student achievements and research opportunities for graduate and undergraduate students. With respect to professional development, one key highlight is the Mechanical Engineering Graduate Student Association (MEGSA) which is an officially Recognized Student Organization (RSO) that gives graduate students excellent leadership experience by organizing seminars and participating in K-12 outreach programs. The Department Chair also created a podcast, Mechanically Incorrect, that highlights faculty research achievements and failures along the way toward success in academia. This has been done as one way for students to learn more about our faculty members' journeys in engineering.

In support of items 2 and 3, we have expanded research activities in the field of hypersonics that include cooperative agreements with Wright Patterson and Eglin Air Force Research Laboratories (AFRL/RW, RQ), invested in wind tunnel experimental facilities to reach Mach 5 in the Poly-Sonic Wind Tunnel (PSWT) (support from both FAMU and FSU), hired four faculty (assistant & associate level) working in the fields of hypersonics, advanced fluid flow diagnostic tools, extreme materials, and robotics (female hire). The junior faculty working on extreme materials is a joint hire between ME and IME (Industrial and Manufacturing Engineering). Our department is also actively recruiting

faculty affiliated with the new FSU Quantum Information and Science initiative to expand our computational and experimental research activities, which aligns with FSU research goals. Faculty hiring has aligned well with recommendations in our QER, which included: hypersonic flows, quantum computing, and robotics/autonomous control.

Our department was also awarded the first AFOSR Center of Excellence, AEROMORPH, to FSU to study next-generation high-speed morphing vehicles using intelligent structures. Regarding interdisciplinary research, these research activities have included computations, experimental methods, controls, information theory, energy systems, and materials science. AEROMORPH and the cooperative agreements with AFRL also include major efforts towards workforce development of students working in our, and Air Force, laboratories. Other workforce development activities have included NASA minority programs and Department of Energy materials research for hydrogen storage. In addition, the Mechanical Engineering graduate seminar has been expanded to include professional development speakers who discuss a variety of topics such as industry/academic/government laboratory professions, navigating graduate school, and leadership.

Whereas we have achieved several of the goals stated in the 2019 QER, there were also weaknesses and threats pointed out. Key weaknesses and *opportunities to overcome these weaknesses* through the creation of an aerospace degree program are given as follows:

- Specific research programs are fragile due to a lack of a critical mass of faculty or the departure of core faculty members (e.g., robotics). *We propose to increase the number of faculty members within our department by 6-10 to support aerospace graduate research and education. These faculty members may also support mechanical engineering and thus stabilize the critical mass of core mechanical and aerospace engineering faculty members.*
- Faculty lines are not always owned by the College of Engineering (e.g., Maglab lines, Materials & Energy cluster hiring), so it may be difficult to replace lost faculty. *It is expected that faculty lines associated with aerospace engineering would reside within the College of Engineering and Department of Mechanical Engineering. A subset of these lines may be joint hires within departments that have interest in this research field such as Mathematics, Materials Science & Engineering, Industrial & Manufacturing Engineering, and Electrical & Computer Engineering. This should provide stability to replace faculty.*
- Difficult to sustain collective core value for internal coherence to develop long-term strategic focus. *The addition of aerospace engineering will create a new strategic focus that will align with the overall strategic direction of mechanical engineering since aerospace engineering overlaps core areas of need within our department including controls, dynamical structures, and advanced materials.*
- Large class sizes due to an inadequate number of faculty. *Additional aerospace faculty will be able to teach many mechanical engineering undergraduate courses. Class size reduction has already been implemented in 2023 upon hiring four new mechanical and aerospace engineering faculty, and this model will continue with additional aerospace engineering faculty.*
- Inadequate representation of women faculty and inadequate representation of

minority and women students. *Mechanical Engineering recently hired one female roboticist, Dr. Taylor Higgins, and will continue to be committed to recruit and mentor female faculty through proper advertising of opportunities within this new program.*

- Inadequate recruitment of FAMU students, especially FAMU scholars. *This will be the first aerospace engineering graduate program at an HBCU which should provid*e excellent *opportunities to attract top FAMU students and scholars.*

**C. For appropriate degree programs, discuss how employer-driven or industry-driven competencies were identified and incorporated into the curriculum. Additionally, indicate whether an industry or employer advisory council exists to provide input for curriculum development, student assessment, and academic-force alignment. If an advisory council is not already in place, describe any plans to develop one or other plans to ensure academic-workforce alignment.**

An advisory council currently exists for the Department of Mechanical Engineering which includes several aerospace industry engineers and Air Force Research Laboratory research scientists. Given the strong overlap of this advisory council, they will assist in providing input to our curriculum and other graduate student support such as internships and scholarships.

## VI. Faculty Participation

**A. Use Appendix A – Table 2 to identify existing and anticipated full-time faculty who will participate in the proposed program through Year 5, excluding visiting or adjunct faculty. Include the following information for each faculty member or position in Appendix A – Table 2:**

- **the faculty code associated with the source of funding for the position**
- **faculty member's name**
- **the highest degree held**
- **academic discipline or specialization**
- **anticipated participation start date in the proposed program**
- **contract status (e.g., tenure, tenure-earning, or multi-year annual [MYA])**
- **contract length in months**
- **percent of annual effort that will support the proposed program (e.g., instruction, advising, supervising)**

**This information should be summarized below in narrative form. Additionally, provide the curriculum vitae (CV) for each identified faculty member in Appendix E.**

The source of funding for all faculty within this program is associated with the Mechanical Engineering Budget 218000110 budget. Faculty members involved in the program are listed below along with details describing their background and amount of participation. All existing faculty members will start supporting the program in year 1 and they are projected to continue supporting the program in year 5.

Alexandre Berger has a PhD in Aerospace Engineering. He specializes in experimental fluid dynamics at both low and high (hypersonic) speeds. He is a tenure-earning faculty

member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 4% for the first year and 13% for the fifth year.

Brandon Krick has a PhD in Mechanical Engineering. He specializes in experimental mechanics and tribology. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 5% for the first year and 15% for the fifth year.

Carl Moore has a PhD in Mechanical Engineering. He specializes in dynamics and haptic systems. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 5% for the first year and 10% for the fifth year.

Chiang Shih has a PhD in Mechanical Engineering. He specializes in experimental fluid dynamics. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 8% for the first year and is anticipated to retire by the fifth year.

Christian Hubicki has a PhD in Mechanical Engineering. He specializes in robotics and optimal control. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 5% for the first year and 15% for the fifth year.

David Larbalestier has a PhD in Physical Metallurgy. He specializes in experimental characterization of superconducting materials. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 5% for the first year and is anticipated to retire by the fifth year.

Eric Hellstrom has a PhD in Materials Science & Engineering. He specializes in experimental characterization of ceramics and superconductors. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 5% for the first year and is anticipated to retire by the fifth year.

Farrukh Alvi has a PhD in Mechanical Engineering. He specializes in experimental fluid dynamics. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 5% for the first year and 5% for the fifth year since he is on a reduced teaching load while working in the FSU Provost office.

Fumitake Kametani has a PhD in Materials Science & Engineering. He specializes in characterization and microscopy of advanced materials. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 5% for the first year and 5% for the fifth year.

Huixuan Wu has a PhD in Mechanical Engineering. He specializes in experimental fluid dynamics and instrumentation development. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 5% for the first year and 18% for the fifth year.

Jizhe Cai has a PhD in Aerospace Engineering. He specializes in experimental characterization of extreme materials. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 15% for the first year and 40% for the fifth year.

Juan Ordonez has a PhD in Mechanical Engineering. He specializes in modeling of advanced energy systems for naval and aerospace applications. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 5% for the first year and 15% for the fifth year.

Kourosh Shoele has a PhD in Mechanical Engineering. He specializes in modeling of fluid-structure interactions. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 5% for the first year and 15% for the fifth year.

Mohd Ali has a PhD in Mechanical Engineering. He specializes in experimental fluid dynamics. He is a teaching faculty member on a twelve-month appointment. His percentage of annual effort that will support the aerospace graduate program is 10% for the first year and 18% for the fifth year.

Neda Yaghoobian has a PhD in Mechanical Engineering. She specializes in modeling of fluid dynamic, atmospheric behavior, and fire dynamics. She is a tenured faculty member on a nine-month appointment. Her percentage of annual effort that will support the aerospace graduate program is 10% for the first year and 40% for the fifth year.

Rajan Kumar has a PhD in Aerospace Engineering. He specializes in experimental characterization of fluid dynamics. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 10% for the first year and 20% for the fifth year.

Unnikrishnan Sasidharan Nair has a PhD in Mechanical Engineering. He specializes in modeling of high speed fluids. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 5% for the first year and 15% for the fifth year.

Wei Guo has a PhD in Physics. He specializes in characterizing quantum turbulence and quantum computing hardware. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 5% for the first year and 12% for the fifth year.

William Oates has a PhD in Mechanical Engineering. He specializes in modeling and experimental characterization of smart materials and adaptive structures. He is a tenured faculty member on a nine-month appointment. His percentage of annual effort that will support the aerospace graduate program is 15% for the first year and 20% for the fifth year. The larger percentage listed here is in anticipation of administrative duties as Department Chair.

Additional faculty members are proposed to be hired over the five-year build-up period. This includes 2 faculty on existing lines that are unfilled. One of these is expected to be at the Assistant Professor level in the field of aerospace structures. This person must

have a PhD in aerospace, mechanical engineering or closely related field. They are expected to be hired into Mechanical Engineering in the fall of 2024 (as part of an ongoing search) and start in the fall of 2025 in the Aerospace Engineering graduate program. His/her percent effort will increase from 20% in year one to 30% in year 5. The second position is expected to be at the Associate Professor level. This person will also have a PhD in aerospace or mechanical engineering or a closely related field. This person is expected to start within the program in the fall of 2025. This existing line is associated with the departure of Prof. Lou Cattafesta from the Mechanical Engineering department in 2023. He/she is expected to commit 30% of their time to this program. Nine additional new faculty lines are proposed (4 tenure-earning Assistant Professors, 2 Associate Professors and 3 Research Faculty). These faculty members are also expected to have PhDs in aerospace or mechanical engineering or a closely related field. They are all expected to contribute 30% of their time to the program by year 5. The hiring will be distributed over years 1-5. In 2026, we plan to hire one Associate Professor and one Assistant Professor. In 2027, we expect to hire 2 Assistant Professors and 1 Research Faculty. In 2028, we expect to hire 2 Research Faculty.

**B. Provide specific evidence demonstrating that the academic unit(s) associated with the proposed program has been productive in teaching, research, and service. Such evidence may include trends over time for average course load, FTE productivity, student HC in major or service courses, degrees granted, external funding attracted, and other qualitative indicators of excellence (e.g., thesis, dissertation, or research supervision).**

All faculty members engaged in this program are active in teaching, research, and service. The most active researchers have on the order of $1.2M-$1.3M research expenditures per year while the average annual research expenditure is on the order of $350,000. This includes basic research through Department of Defense programs (e.g., ARO, AFOSR, ONR, DARPA), the National Science Foundation (NSF), and the Department of Energy (DOE). One of our Assistant Professors, Prof. Unni Nair, received the ONR Young Faculty Award in 2023 which is a highly prestigious young faculty grant. He will be expanding research in computational fluid dynamics of high speed flows. Five other faculty within this cohort have been awarded the NSF CAREER and two have been awarded the DARPA Young Faculty Award (YFA). With respect to teaching, all tenured and tenure-track faculty teach a nominal 3 courses per year (2+1 or 1+2) excluding new faculty. We provide junior faculty with a reduced course load (1+1) so that they can spend more time building their research program, recruiting students, and learning new pedagogical methods. Other exclusions to this teaching load are applied to faculty members with high research activity or high service load (e.g., department chair, center director). However, some faculty continue to teach despite large service and research loads. For example, Prof. Rajan Kumar created a new course on hypersonic flows which was co-taught with Prof. Unni Nair in the spring of 2023. Prof. Kumar is the Director of FCAAP and also had over $1M of research expenditures last year. Teaching instructors are expected to be on 12 month contracts and teach a full load of 3+3+2 courses. Exclusions to this rule are considered for courses that contain additional experimental laboratory elements or recitations. Additionally, the Mechanical Engineering Department created an online Aerospace Engineering Certificate through FSU which included the creation of seven new online courses that are currently offered asynchronously. Additionally, four of the seven new courses are Quality Matters (QM) certified. These

teaching activities are in addition to normal Mechanical Engineering course offerings. All faculty are required to participate in a variety of service activities including contributions to department, college, and university committees and contributions to the broader community which may include research communities and/or K-12 programs.

## VII. Estimate of Investment

**A. Use Appendix A – Table 3A or 3B to provide projected costs and associated funding sources for Year 1 and Year 5 of program operation. In narrative form, describe all projected costs and funding sources for the proposed program(s). Data for Year 1 and Year 5 should reflect snapshots in time rather than cumulative costs.**

The base reallocation (E&G) for Year 1 is $237,825 of faculty salaries and benefits. Additional programmatic expenses are $10,000 for graduate student recruitment. The base reallocation (E&G) in Year 1 also includes $10,000 for 0.3 FTE A&P or OPS for support staff plus $50,000 OPS funds for assistantships and fellowships to help attract high-quality graduate students whose salary is primarily supported by C&G. The total E&G reallocated in Year 1 is $307,825. The estimated amount of C&G in Year 1 is $456,871. This estimate is based on five-year research expenditure averages of the faculty involved in the program times their percent effort to the new program. The C&G is assumed to be distributed across faculty summer salaries, student stipends, materials, and travel expenses.

In Year 5, the Continuing Base (E&G) includes $588,375 in faculty salaries and benefits, $15,000 for student recruiting events and other programmatic expenses, $50,000 in A&P/OPS staff support, and $50,000 OPS funds for assistantships and fellowships. The C&G in Year 5 is estimated to be $1,158,849 based on estimated research grants and contracts of new faculty members.

**B. See Appendix A for details. Use Appendix A – Table 4 to show how existing Education & General (E&G) funds will be reallocated to support the proposed program in Year 1. Describe each funding source identified in Appendix A – Table 4, and justify below the reallocation of resources. Describe the impact the reallocation of financial resources will have on existing programs, including any possible financial impact of a shift in faculty effort, reallocation of instructional resources, greater use of adjunct faculty and teaching assistants, and explain what steps will be taken to mitigate such impacts.**

The Mechanical Engineering Budget 218000110 includes $3,534,076 base before reallocation. The amount to be reallocated is $307,825. A negligible impact on the Mechanical Engineering Department is anticipated given the shared mission of engineering research and education between mechanical and aerospace engineering. Furthermore, aerospace engineering research and education are well aligned with other programs at the College of Engineering including Industrial and Manufacturing Engineering, Electrical and Computer Engineering, and Materials Science and Engineering. We expect the alignment of aerospace engineering with existing engineering programs to minimize any unforeseen impacts on resource allocation.

**C. If the institution intends to operate the program as self-supporting, market**

**tuition rate, or establish a differentiated graduate-level tuition, as described in Board of Governors Regulation 8.002, provide a rationale and a timeline for seeking Board of Governors' approval.**

**☒ Not applicable to this program because the program will not operate as self-supporting, market tuition rate, or establish a differentiated graduate-level tuition.**

**D. Provide the expected resident and non-resident tuition rate for the proposed program for both resident and non-resident students. The tuition rates should be reported per credit hour unless the institution has received approval for a different tuition structure. If the proposed program will operate as a continuing education program per Board of Governors Regulation 8.002, describe how the tuition amount was calculated and how it is reflected in Appendix A – Table 3B.**

Registration and tuition fees are established by the Board of Education and the FSU and FAMU Board of trustees as required by the Florida Legislature. The program will apply the graduate tuition fees as outlined in the following schedule. The fees are subject to change without notice.

| | In-State | Out-of-State |
|---|---|---|
| FSU* | $479.32 | $1,110.72 |
| FAMU** | $405.67 | $1,022 |

*Per credit hour does not include the Student Facilities Use Fee assessed to Main Campus Students at the rate of $20 per semester.
**Per credit hour does not include a required fees of $70 for fall and spring semesters each and $33 for summer semester.

**E. Describe external financial and in-kind resources available to support the proposed program and explain how this amount is reflected in Appendix A – Table 3A or 3B.**

## VIII. Self-Supporting and Market Tuition Rate Programs

***Note: Skip this section If the proposed program will not operate as a self-supporting or market tuition rate program.***

**Proposed Program Type**

**☐ Market Tuition Rate Program**
- **☐ Online**
- **☐ Continuing Education**

**☐ Self-Supporting Program**

**☒ N/A**

**A. Provide supporting documentation in a separate attachment that serves as evidence that the new program will not supplant any existing similar or equivalent E&G degree offering. Describe the evidence in narrative form below. *Note that Board Regulation 8.002 considers a program similar if it is offered under the same CIP code as one funded under the E&G budget entity.***

The Department Chair, William Oates, contacted chairs in Florida who have aerospace graduate programs. This includes programs at the University of Florida and the University of Central Florida. Both chairs have given their support to starting a program at the FAMU-FSU College of Engineering. Email correspondences are included in Appendix B describing the details of these discussions.

In terms of the potential impact on the FAMU-FSU Department of Mechanical Engineering, there will be some level of impact on this department since there is a subset of graduate students within ME who conduct aerospace engineering research. However, the overall number of graduate students in aerospace and mechanical engineering is expected to grow by offering the additional choice of either a graduate degree in mechanical or aerospace engineering. This is primarily due to a broader range of course offerings and research opportunities in both mechanical and aerospace engineering.

**B. If the proposed self-supporting or market tuition rate program will be a track under an existing E&G program or has a similar existing E&G program, provide a side-by-side tuition and fee comparison in the table below. Provide a link to the university's website that provides students with information about financial assistance and obligations for repayment of loans for these programs.**

**☒ Not applicable because the program will not be a track under an existing E&G program or is not similar to an existing E&G program.**

**Tuition and Fee Comparison**

| E&G Track or Program | Proposed Program |
|---|---|
| | |

**C. Explain whether the program leads to initial licensing or certification in occupational areas identified as a state critical workforce need. If so, which licenses and certifications will graduates receive upon completion, and explain why implementing the program as self-supporting or market tuition rate is the best strategy to increase the number of graduates in the state.**

***Note: Questions D – M pertain only to market tuition rate programs. If the proposed program will be self-supporting, skip to Section IX.***

**D. Explain the process used to determine the proposed market tuition rate and provide the tuition of similar programs offered by other SUS institutions and private institutions as appropriate so that the tuition of at least five similar programs is provided. If the proposed tuition rates differ for resident and non-resident students, explain why.**

**E. Explain how offering the proposed program at a market tuition rate is aligned with the university's mission. If the program qualifies as a Program of Strategic Emphasis, provide additional justification for charging higher tuition for the proposed program.**

**F. Provide a declaratory statement that offering the proposed program at the market tuition rate does not increase the state's fiscal liability or obligation.**

**G. Explain any proposed restrictions, limitations, or conditions to be placed on the program.**

**H. Explain how the university will ensure sufficient courses are available to meet student demand and facilitate program completion.**

**I. If applicable, provide a baseline of current enrollments, including a breakout of resident and non-resident enrollment in similar courses funded by the E&G budget entity.**

**J. Describe any outcome measures that will be used to determine the program's success.**

**K. List the campuses and/or sites at which the proposed program will be offered. If the program is only offered online, indicate that, and provide the location from which the program will be managed.**

**L. Provide an estimate of the total and net annual revenue the university anticipates collecting for Years 1 and 5 if the proposal is approved. This information should be consistent with the data provided in Appendix A – Table 3B, which is required as a part of this proposal.**

**M. Describe how revenues will be spent, including whether private vendors will be utilized and for what purpose. Additionally, identify all budget entities used for the program.**

## IX. Non-Faculty Resources

**A. Describe library resources currently available to implement and/or sustain the proposed program through Year 5 below, including but not limited to the following:**

- **the total number of volumes and serials available in the discipline and related disciplines**
- **all major journals that are available to the university's students**

**The Library Director must sign the additional signatures page to indicate they have reviewed Sections IX.A. and IX.B.**

The following library resources through FAMU are available to support aerospace engineering:

**Electronic Databases**

The databases contain full-text articles, abstracts, conference proceedings, book chapters, newsletters, online journals, e-book collections, and other research content in the fields of science, engineering, and technology.

1. Abstracts in New Technology and Engineering
2. Access Engineering
3. ACM Digital Library
4. ACS Journals
5. Applied Science & Technology Source
6. Ceramic Abstracts
7. Civil Engineering Abstracts (ProQuest)
8. Compendex
9. Computing (Advanced Technologies and Aerospace Database)
10. Engineering Collection
11. Engineered Materials Abstracts (ProQuest)
12. Engineering Village
13. Environmental Engineering Abstracts
14. IEEE Xplore
15. Inspec
16. IOP Electronic Journals
17. Mary Ann Liebertpub
18. Materials Business Files
19. Materials Research Database
20. Mechanical & Transportation Engineering Abstracts
21. Mechanical Engineering Abstracts
22. ProQuest Engineering Research Database
23. ScienceDirect
24. SpringerLink
25. Solid State & Superconductivity Abstracts
26. Sustainability Science Abstracts

**Online Journals (Accessible Directly from the Online Catalog)**

Additional journals and journal articles related to aerospace engineering are available in the online databases, which are also accessible from online. The list below is limited to the titles that are accessible directly from the online catalog. The full list of journals, that are accessible through the databases, is significantly more extensive.

1. *International Journal of Aerospace Engineering (2007-)*. Hindawi Publishing Corporation.
2. *Journal of Aerospace Engineering (1988)*. American Society of Civil Engineers. Aerospace Division.
3. *Advances in Aerospace Engineering (2014)*. Hindawi Publishing Corporation.
4. *Transport and Aerospace Engineering (2014)*.
5. *Aircraft Engineering and Aerospace Technology (1986)*.
6. *Proceedings of the Institution of Mechanical Engineers*. Part G, Journal of Aerospace Engineering (1989-). Institution of Mechanical Engineers.
7. *Journal of the Institution of Engineers*. *Series C. Mechanical, Production, Aerospace and Marine Engineering* (2012). Institution of Engineers.
8. *IEEE transactions on Aerospace and Electronic Systems (1965)*. IEEE Aerospace and Electronic Systems Society.

9. *SAE International Journal of Aerospace (2009)*. Society of Automotive Engineers.
10. *International Journal of Aviation, Aeronautics, and Aerospace (2014-)*. Embry-Riddle Aeronautical University.
11. *IEEE Aerospace and Electronic Systems Magazine (1988)*. IEEE Aerospace and Electronic Systems Society.
12. *Mathematics in Engineering, Science and Aerospace: MESA (2010-)*.
13. *Astrodynamics (2017-)*.
14. *International Journal of Micro Air Vehicles (2009-)*.
15. *International Journal of Aerospace Innovations (2009-2013)*.
16. *International Journal of Aeronautical and Space Sciences*.
17. *Journal of KONBIN (2006)*.
18. *Aviation (2003)*.
19. *Aerospace (2014)*.
20. *Annals of Solid and Structural Mechanics (2010-*)
21. *The International Journal of Aerospace Psychology (2017-*). Taylor and Francis: Association for Aviation Psychology.
22. *Visualization in Engineering (2013).* Curtin University.
23. *SAE International Journal of Passenger Cars* (2009-). Society of Automotive Engineers.
24. *SAE International Journal of Alternative Powertrains* (2012-2019). Society of Automotive Engineers.
25. *International Journal of Engine Research*. Society of Automotive Engineers (2000). Society of Automotive Engineers.
26. *International Journal of Heat and Fluid Flow* (1979-). Institution of Mechanical Engineers.
27. *SAE International Journal of Materials and Manufacturing* (2009). Society of Automotive Engineers.
28. *Stapp Car Crash Journal* (2000-). Stapp Car Crash Conference. SAE International Society. Society of Automotive Engineers.
29. *SAE International Journal of Fuels and Lubricants* (2009-). Society of Automotive Engineers.
30. *SAE International Journal of Commercial Vehicles (2009-). Society of Automotive Engineers.*
31. *SAE International Journal of Passenger Cars. Electronic and Electrical Systems (2009-).* Society of Automotive Engineers.
32. *SAE International Journal of Engines (2009-*). Society of Automotive Engineers.
33. *Applied Adhesion Science (2013-*). Brazilian Society of Adhesion and Adhesives.
34. *The Journal of Air Law and Commerce (1939-*). Southern Methodist University, School of Law. Northwestern University, School of Law. Northwestern University, School of Business. Northwestern University, Transportation Center.

**Books (Electronic Books)**

The books listed below are a sample of the books and conference proceedings that are available directly from the online catalog. There are over 1,100 books listed in the catalog that are related to aerospace engineering. The books listed below are some of the most recent publications, between the years of 2020 to 2024. Additional books and book chapters are available from the online databases.

1. Post-Processing Techniques for Additive Manufacturing
Alam, Zafar, editor.; Iqbal, Faiz, editor.; Ahmad Khan, Dilshad, editor. 2024
2. Energy-efficient electrical systems for buildings
Krarti, Moncef, author. 2024
3. Aircraft performance : an engineering approach
Sadraey, Mohammad H., author. 2024
4.Human factors in simulation and training : application and practice
Vincenzi, Dennis A., editor. 2024
5. Advanced Materials Processing and Manufacturing : Research, Technology, and Applications
Bolokang, Amogelang Sylvester, author.; Mathabathe, Maria Ntsoaki, author. 2024
6. Automation in Construction Toward Resilience : Robotics, Smart Materials and Intelligent Systems
Farsangi, Ehsan Noroozinejad, editor. 2024
7. Navigating the Complexity Across the Peace-Sustainability-Climate Security Nexus
Amadei, Bernard, 1954- author. 2024
8. Human factors in simulation and training : theory and methods
Vincenzi, Dennis A., editor. 2024
9. Laser-based technologies for sustainable manufacturing
Kumar, Avinash, Dr., editor.; Ashwani Kumar, editor.; Kumar, Abhishek, editor. 2024
10. Composite Materials : High Strain Rate Studies
Velmurugan, R. (Professor of aerospace engineering), editor.; Ruan, Dong, editor.; Gurusideswar, S. (Professor of aerospace engineering), editor. 2024
11. Data Driven Methods for Civil Structural Health Monitoring and Resilience : Latest Developments and Applications
Noori, Mohammad, author. 2024
12. Post-Processing Techniques for Additive Manufacturing
Alam, Zafar, editor.; Iqbal, Faiz, editor.; Ahmad Khan, Dilshad, editor. 2024
13. Energy-efficient electrical systems for buildings
Krarti, Moncef, author. 2024
14. Aircraft performance : an engineering approach
Sadraey, Mohammad H., author. 2024
15. Human factors in simulation and training : application and practice
Vincenzi, Dennis A., editor. 2024

**Books**

1. Advanced Materials Processing and Manufacturing: Research, Technology, and Applications Bolokang, Amogelang Sylvester, author.; Mathabathe, Maria Ntsoaki, author.2024.
2. Automation in Construction Toward Resilience : Robotics, Smart Materials and Intelligent Systems, Farsangi, Ehsan Noroozinejad, editor. 2024
3. Navigating the Complexity Across the Peace-Sustainability-Climate Security Nexus Amadei, Bernard, 1954- author. 2024
4. Human factors in simulation and training: theory and methods Vincenzi, Dennis A., editor. 2024
5. Laser-based technologies for sustainable manufacturing Kumar, Avinash, Dr., editor.;

Ashwani Kumar, editor.; Kumar, Abhishek, editor. 2024

6. Composite Materials : High Strain Rate Studies Velmurugan, R. (Professor of aerospace engineering), editor.; Ruan, Dong, editor.; Gurusideswar, S. (Professor of aerospace engineering), editor. 2024
7. Data Driven Methods for Civil Structural Health Monitoring and Resilience : Latest Developments and Applications Noori, Mohammad, author. 2024
8. Applications of unsaturated polyester resins : synthesis, modifications, and preparation methods, Thomas, Sabu, editor.; Chirayil, Cintil Jose, editor. 2023
9. Applications of multifunctional nanomaterials Thomas, Sabu, editor.; Kalarikkal, Nandakumar, editor.; Abraham, Ann Rose, editor. 2023
10. Elastic wave propagation in structures and materials Gopalakrishnan, S. (Srinivasan), author. 2023
11. Radar and radionavigation : pre-professional training for aviation radio specialists Kozlov, Anatoly Ivanovich, author.; Shatrakov, Yuri Grigoryevich, author.; Zatuchny, Dmitry Alexandrovich, author. 2023
12. Synthetic and Natural Nanofillers in Polymer Composites : Properties and Applications Nurazzi, N. M., editor. 2023
13. Sheet Metal 2023., Hagenah, H. 2023
14. Basic fracture mechanics and its applications Saxena, A. (Ashok), author. 2023
15. Reliability engineering : a life cycle approach Bradley, Edgar, author. 2023
16. Nanomaterials for sustainable tribology Raina, Ankush, editor. 2023
17. Space situational awareness : guiding the transition to a civil capability : hearing before the Subcommittee on Space and Aeronautics of the Committee on Science, Space and Technology, of the House of Representatives, One Hundred Seventeenth Congress, second session, May 12, 2022. United States. Congress. House. Committee on Science, Space, and Technology (2011- ). Subcommittee on Space and Aeronautics, author. 2023
18. Engineering dynamics : fundamentals and applications Islam, M. Rashad, author.; Ahmed, Mahbub (Engineer), author.; Mazumder, A K M Monayem H, author. 2023
19. Design and analysis of functionally graded adhesively bonded joints of FRP composites Panigrahi, Sashi Kanta, author.; Nimje, Sunil V., author. 2023
20. Advanced manufacturing processes Singh, Yashvir, editor. 2023
21. Advances in combustion technology Mishra, Debi Prasad (Professor of aerospace engineering), editor. 2023
22. Fundamentals of thermal spraying S, Ariharan, editor. 2023
23. Additive manufacturing with medical applications Kumar Banga, Harish, editor. 2023
24. Ratio of momentum diffusivity to thermal diffusivity : introduction, meta-analysis, and scrutinization Animasaun, Isaac Lare, author. 2023
25. Rapid cure composites : materials, processing and manufacturing Hameed, Nishar, editor. 2023
26. Smart coatings : fundamentals, developments, and applications Kathavate, Vaibhav

Sanjay, author.; Deshpande, Pravin Pralhad, author. 2023

27. Materials for lightweight constructions Kumaran, S. Thirumalai, editor. 2023
28. Creep : fatigue models of composites and nanocomposites Razdolsky, Leo, author. 2023
29. Advances in structural adhesive bonding Dillard, David A., editor. 2023
30. Metaversed : see beyond the hype Martins, Luis Bravo, author.; Wolfe, Samantha G, author. 2023
31. Reliability and physics-of-healthy in mechatronics Delaux, David, editor.; El Hami, Abdelkhalak, editor.; Grzesowiak, Henri, editor. 2023
32. Polymer crystallization : methods, characterization, and applications Parameswaranpillai, Jyotishkumar, editor. 2023
33. Carbon nanotubes : functionalization and potential applications Abraham, Ann Rose, editor.; George, Soney C., editor.; Haghi, A. K., editor. 2023
34. Advanced Control of Flight Vehicle Maneuver and Operation. Liu, Chuang.; Dai, Honghua.; Yue, Xiaokui. 2023
35. Space missions of global importance : planetary defense, space weather protection, and space situational awareness : hearing before the Committee on Commerce, Science, and Transportation, United States Senate, One Hundred Sixteenth Congress, second session, February 12, 2020. United States. Congress. Senate. Committee on Commerce, Science, and Transportation, author. 2023
36. Aerospace and associated technology : proceedings of the joint conference of ICTACEM 2021, APCATS 2021, AJSAE 2021 and AeSI 2021 Ghosh, Anup, editor. 2023
37. Autonomous Trajectory Planning and Guidance Control for Launch Vehicles Song, Zhengyu. editor.; Zhao, Dangjun. editor.; Theil, Stephan. editor. 2023
38. Design for Electromagnetic Compatibility--In a Nutshell Theory and Practice Keller, Reto B. author. 2023
39. Building the space workforce of the future : STEM engagement for a 21st century education : hearing before the Subcommittee on Aviation and Space of the Committee on Commerce, Science, and Transportation, United States Senate, One Hundred Sixteenth Congress, first session, November 5, 2019. United States. Congress. Senate. Committee on Commerce, Science, and Transportation. Subcommittee on Aviation and Space, author. 2023
40. Polymer composite systems in pipeline repair : design, manufacture, application, and environmental impacts Mavinkere Rangappa, Sanjay, editor. 2023
41. Flexible Automation and Intelligent Manufacturing: The Human-Data-Technology Nexus Proceedings of FAIM 2022, June 19–23, 2022, Detroit, Michigan, USA Kim, Kyoung-Yun; Kim, Kyoung-Yun. editor.; Monplaisir, Leslie. editor.; Rickli, Jeremy. editor. 2023
42. Computational methods for nonlinear dynamical systems : theory and applications in aerospace engineering Wang, Xuechuan, 1956- author. 2023
43. 10th Manufacturing Engineering Society International Conference (MESIC 2023).

Morales-Palma, Domingo.; Martínez-Donaire, Andrés J.; Borrego Puche, Marcos.; Centeno Báez, Gabriel.; Vallellano, Carpoforo. 2023

44. High-reliability autonomous management systems for spacecraft Zhang, Jianjun, 1942- author.; Li, Jing, author. 2023
45. Essentials of mechanical stress analysis Javidinejad, Amir, author. 2023
46. Applications of unsaturated polyester resins : synthesis, modifications, and preparation methods Thomas, Sabu, editor.; Chirayil, Cintil Jose, editor. 2023
47. Applications of multifunctional nanomaterials Thomas, Sabu, editor.; Kalarikkal, Nandakumar, editor.; Abraham, Ann Rose, editor. 2023
48. Elastic wave propagation in structures and materials Gopalakrishnan, S. (Srinivasan), author. 2023
49. Radar and radionavigation : pre-professional training for aviation radio specialists Kozlov, Anatoly Ivanovich, author.; Shatrakov, Yuri Grigoryevich, author.; Zatuchny, Dmitry Alexandrovich, author. 2023
50. Synthetic and Natural Nanofillers in Polymer Composites : Properties and Applications Nurazzi, N. M., editor. 2023
51. Sheet Metal 2023. Hagenah, H. 2023
52. Basic fracture mechanics and its applications Saxena, A. (Ashok), author. 2023
53. Reliability engineering : a life cycle approach Bradley, Edgar, author. 2023
54. Nanomaterials for sustainable tribology Raina, Ankush, editor. 2023
55. Space situational awareness : guiding the transition to a civil capability : hearing before the Subcommittee on Space and Aeronautics of the Committee on Science, Space and Technology, of the House of Representatives, One Hundred Seventeenth Congress, second session, May 12, 2022. United States. Congress. House. Committee on Science, Space, and Technology (2011- ). Subcommittee on Space and Aeronautics, author. 2023
56. Engineering dynamics : fundamentals and applications Islam, M. Rashad, author.; Ahmed, Mahbub (Engineer), author.; Mazumder, A K M Monayem H, author. 2023
57. Design and analysis of functionally graded adhesively bonded joints of FRP composites Panigrahi, Sashi Kanta, author.; Nimje, Sunil V., author. 2023
58. Advanced manufacturing processes Singh, Yashvir, editor. 2023
59. Advances in combustion technology Mishra, Debi Prasad (Professor of aerospace engineering), editor. 2023
60. Fundamentals of thermal spraying S, Ariharan, editor. 2023
61. Additive manufacturing with medical applications Kumar Banga, Harish, editor. 2023
62. Ratio of momentum diffusivity to thermal diffusivity : introduction, meta-analysis, and scrutinization Animasaun, Isaac Lare, author. 2023
63. Rapid cure composites : materials, processing and manufacturing Hameed, Nishar, editor. 2023
64. Smart coatings : fundamentals, developments, and applications Kathavate, Vaibhav Sanjay, author.; Deshpande, Pravin Pralhad, author. 2023

65. Materials for lightweight constructions Kumaran, S. Thirumalai, editor. 2023
66. Creep : fatigue models of composites and nanocomposites Razdolsky, Leo, author. 2023
67. Advances in structural adhesive bonding Dillard, David A., editor. 2023
68. Metaversed : see beyond the hype Martins, Luis Bravo, author.; Wolfe, Samantha G, author. 2023
69. Reliability and physics-of-healthy in mechatronics Delaux, David, editor.; El Hami, Abdelkhalak, editor.; Grzesowiak, Henri, editor. 2023
70. Polymer crystallization : methods, characterization, and applications Parameswaranpillai, Jyotishkumar, editor. 2023
71. Carbon nanotubes : functionalization and potential applications Abraham, Ann Rose, editor.; George, Soney C., editor.; Haghi, A. K., editor. 2023
72. Advanced Control of Flight Vehicle Maneuver and Operation. Liu, Chuang.; Dai, Honghua.; Yue, Xiaokui. 2023
73. Space missions of global importance : planetary defense, space weather protection, and space situational awareness : hearing before the Committee on Commerce, Science, and Transportation, United States Senate, One Hundred Sixteenth Congress, second session, February 12, 2020. United States. Congress. Senate. Committee on Commerce, Science, and Transportation, author. 2023
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82. High-reliability autonomous management systems for spacecraft Zhang, Jianjun, 1942- author.; Li, Jing, author. 2023
83. Essentials of mechanical stress analysis Javidinejad, Amir, author. 2023
84. Advanced composites in aerospace engineering applications Mazlan, Norkhairunnisa, editor; Sapuan, S. M., editor,: Ilyas, R. A. editor. 2022
85. Polymeric nanocomposites with carbonaceous nanofillers for aerospace applications Kausar, Ayesha, Author. 2022
86. Computational fluid dynamics in aerospace engineering: recent advances Sekar, Manigandan, author.; Webb, Phil, author.; Sohret, Yasin, author. 2022
87. Trends in development of accelerated testing for automotive and aerospace engineering Klyatis, Lev M., author. 2020.

The following library resources through FSU are available to support aerospace engineering as of January 2024:

**Databases**

This is a selection of databases that contain research materials, including articles, conference proceedings, data sets, and more, related to the field of aerospace engineering and the wider field of engineering accessible through FSU Libraries.

1. AccessEngineering
2. ACM Digital Library
3. Aerospace Research Central or American Institute of Aeronautics and Astronautics (AIAA)
4. American Society of Civil Engineers (ASCE) Civil Engineering Database
5. American Society of Civil Engineers (ASCE) Journals
6. Applied Science & Technology Source
7. ASM Alloy Phase Diagram Database
8. ASTM Compass
9. BCC Research
10. Compendex (Engineering Village)
11. Derwent Innovations Index
12. Electronics & Communications Abstracts
13. Emerald Library E-Journals (Emerald Insight)
14. Engineering Village
15. Environmental Engineering Abstracts
16. Environmental Impact Statements: Digests
17. IEEE Xplore
18. INSPEC (Engineering Village)
19. INSPEC Archive (Engineering Village)
20. Journal of Visualized Experiments (JOVE)
21. Materials Business File
22. Materials Science & Engineering Database
23. Mechanical & Transportation Engineering Abstracts
24. METADEX
25. OSTI.GOV
26. PubMed (NLM)

27. Science (AAAS)
28. SciFinder-n
29. SciTech Premium Collection (ProQuest)
30. Scopus
31. Solid State and Superconductivity Abstracts
32. Tallahassee-Leon County Geographic Information Systems
33. TerraFly
34. Textile Technology Complete
35. Thieme MedOne Education (E-Books)
36. Toxicology Abstracts
37. TOXLINE
38. U.S. Department of the Interior Bureau of Land Management General Land Office Documents
39. UCentral
40. Virology and AIDS Abstracts

**Serials**

FSU has **246** current and historical aerospace related scholarly journals accessible through the library catalog. Additional research articles and information can be found through the previously listed databases.

1. *Advances in Aerospace Engineering* (2014) Hindawi Publishing Corporation.
2. *Aerospace* (2014) MDPI AG.
3. *Aerospace America* (1984) American Institute of Aeronautics and Astronautics.
4. *Aerospace power journal* (1999) AU Press.
5. *Aerospace science and technology* (1997) Gauthier-Villars.
6. *AIAA journal* (1963) American Institute of Aeronautics and Astronautics.
7. *Air and space lawyer* (1984) Forum Committee on Air and Space Law, American Bar Association.
8. *Air & space power journal* (2002) AU Press.
9. *Air power history* (2021) Air Force Historical Foundation.
10. *Aircraft engineering* (1986) Bunhill Publications.
11. *Aircraft engineering and aerospace technology* (1986) Emerald Group Pub.
12. *Airpower journal* (1987) AU Press.
13. *Annals of air and space law* (1976) Institute of Air and Space Law.
14. *Archives of environmental health* (2004) Heldref Publications.
15. *Armed forces and society* (1974) Transaction Publishers.
16. *Astrodynamics* (2017) Tsinghua University Press.
17. *Aviation* (2003) Taylor & Francis.
18. *Aviation space and environmental medicine* (2014) Aerospace Medical Association.
19. *CEAS space journal* (2011) Springer.
20. *Extreme life, biospeology & astrobiology* (2009) Bioflux Pub. House.
21. *Human performance in extreme environments* (1996) Society for Human Performance in Extreme Environments.
22. *IEEE transactions on aerospace and electronic systems* (1965) Institute of Electrical and Electronics Engineers.
23. *IEEE aerospace and electronic systems magazine* (1988) Institute of Electrical and Electronics Engineers.
24. *IEEE Transactions on Software Engineering* (n.d.) Institute of Electrical and

Electronics Engineers.
25. *International journal of aeronautical and space sciences* (n.d.) Korean Society for Aeronautical and Space Sciences.
26. *International journal of aerospace engineering* (2007) Hindawi Pub. Corp.
27. *International journal of aerospace innovations* (2009) Multi-Science Pub. Co Ltd.
28. *International journal of aviation, aeronautics, and aerospace* (2014) Embry-Riddle Aeronautical University.
29. *International journal of aviation psychology* (1991) Lawrence Erlbaum Associates.
30. *International journal of micro air vehicles* (2009) SAGE Publications.

**Books**

FSU has **871** books under the Library of Congress subject heading "aerospace engineering" and **2596** books in the wider field of aerospace studies. These volumes include books in our physical collection and books we have digital access to. Here is a selection of some of the recently published books in our collection.

1. Aswal, D. K., Sarkar, P. S., & Kashyap, Y. S. (2022). *Neutron Imaging: Basics, Techniques and Applications*. Springer Singapore. https://doi.org/10.1007/978-981-16-6273-7
2. Bennett, S. A. (2021). *Safety in Aviation and Astronautics: A Socio-technical Approach* (1st edition). Routledge. https://doi.org/10.4324/9781003111283
3. Cakaj, S. (2022). *Ground Station Design and Analysis for LEO Satellites: Analytical, Experimental and Simulation Approach* (1st ed.). John Wiley & Sons, Inc. https://doi.org/10.1002/9781119899280
4. Cao, H. (2023). *Dual-Mass Linear Vibration Silicon-Based MEMS Gyroscope*. Springer Nature Singapore. https://doi.org/10.1007/978-981-19-9247-6
5. Catalina Popescu. (2022). *Filling the Center, Fighting the Power Void: Choosing Trajan as a Successor*. SAGE Publications: SAGE Business Cases Originals. https://doi.org/10.4135/9781529772227
6. Di Rito, G. (2023). *Electro-Mechanical Actuators for Safety-Critical Aerospace Applications*. MDPI - Multidisciplinary Digital Publishing Institute. https://doi.org/10.3390/books978-3-0365-7932-0
7. Dolgikh, G. I. (2022). *Sea Level Fluctuations*. MDPI - Multidisciplinary Digital Publishing Institute.
8. Doro-on, A. M. (2022). *Handbook of Systems Engineering and Risk Management in Control Systems, Communication, Space Technology, Missile, Security and Defense Operations* (1st ed.). Taylor & Francis. https://doi.org/10.4324/9780429272233
9. Furey, H. (2021). *Beyond the Code: A Philosophical Guide to Engineering Ethics*. Routledge. https://doi.org/10.4324/9781315643816
10. Graham, A., & Halpern, N. (2021). *Airport Marketing* (Second edition.). Taylor & Francis. https://doi.org/10.4324/9780203117903
11. Gynnild, A. (2022). *Droner i sivilsamfunnet: Aktører, teknologi og etiske utfordringer*. Cappelen Damm Akademisk/NOASP Nordic Open Access Scholarly Publishing. https://doi.org/10.23865/noasp.161
12. Jameson, A. (2022). *Computational Aerodynamics* (1st ed., Vol. 49). University Press. https://doi.org/10.1017/9781108943345
13. Keller, R. B. (2023a). *Design for Electromagnetic Compatibility—In a Nutshell Theory and Practice* (1st ed. 2023.). Springer Nature. https://doi.org/10.1007/978-3-031-14186-7

14. Keller, R. B. (2023b). *Design for Electromagnetic Compatibility--In a Nutshell: Theory and Practice* (1st Edition 2023). Springer International Publishing. https://doi.org/10.1007/978-3-031-14186-7
15. Koskinen, H. E. J., & Kilpua, E. K. J. (2022). *Physics of Earth's Radiation Belts: Theory and Observations* (1st Edition 2022). Springer International Publishing. https://doi.org/10.1007/978-3-030-82167-8
16. Liu, S., Li, L., Tang, J., Wu, S., & Gaudiot, J.-L. (2020). *Creating Autonomous Vehicle Systems* (1st ed., Vol. 9). Springer International Publishing. https://doi.org/10.1007/978-3-031-01805-3
17. McElroy Jr, M. W. (2022). *The Space Industry of the Future: Capitalism and Sustainability in Outer Space* (1st ed.). Routledge. https://doi.org/10.4324/9781003268734
18. Refait, P. (2022). *Corrosion and Protection of Steels in Marine Environments: State-of-the-Art and Emerging Research Trends*. MDPI - Multidisciplinary Digital Publishing Institute.
19. Salmi, M. (2022). *Design and Applications of Additive Manufacturing and 3D Printing*. MDPI - Multidisciplinary Digital Publishing Institute.
20. Schuurman, M. (2023). *Air Safety Investigation: The Journey*. TU Delft Open. https://doi.org/10.5074/t.2023.004
21. Song, Z., Zhao, D., & Theil, S. (2023a). *Autonomous Trajectory Planning and Guidance Control for Launch Vehicles* (1st ed. 2023.). Springer Nature Singapore. https://doi.org/10.1007/978-981-99-0613-0
22. Song, Z., Zhao, D., & Theil, S. (2023b). *Autonomous Trajectory Planning and Guidance Control for Launch Vehicles* (1st Edition 2023). Springer Nature Singapore. https://doi.org/10.1007/978-981-99-0613-0
23. Stoica, L., Riches, S., & Johnston, C. (2016). *High Temperature Electronics Design for Aero Engine Controls and Health Monitoring* (1st ed.). River Publishers. https://doi.org/10.1201/9781003338420
24. United States Congress House Committee on Science, S. (2022). *Examining R&D pathways to sustainable aviation: Hearing before the Subcommittee on Space and Aeronautics of the Committee on Science, Space, and Technology, House of Representatives, One Hundred Seventeenth Congress, first session, March 24, 2021.* U.S. Government Publishing Office.
25. United States Congress Senate Committee on Commerce, S. (2023). *Building the space workforce of the future: STEM engagement for a 21st century education : hearing before the Subcommittee on Aviation and Space of the Committee on Commerce, Science, and Transportation, United States Senate, One Hundred Sixteenth Congress, first session, November 5, 2019.* U.S. Government Publishing Office.
26. van Loon, J. J. A., & Beysens, D. A. (2015). *Generation and Applications of Extra-Terrestrial Environments on Earth* (1st ed.). Routledge. https://doi.org/10.1201/9781003338277
27. Weiß, S. (2022). *Contributions to on-board navigation on 1U CubeSats* (Vol. 11). Universitätsverlag der Technischen Universität Berlin. https://doi.org/10.14279/depositonce-12416
28. Wen, C.-Y., Jiang, Y., & Shi, L. (2023). *Space–Time Conservation Element and Solution Element Method: Advances and Applications in Engineering Sciences* (1st Edition 2023, Vol. 13). Springer Nature Singapore. https://doi.org/10.1007/978-981-99-0876-9
29. Wiedemann, M. (2024a). *System Lightweight Design for Aviation* (1st ed. 2024.).

Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-44165-3
30. Wiedemann, M. (2024b). *System Lightweight Design for Aviation*. Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-44165-3

**B. Discuss any additional library resources needed to implement and/or sustain the program through Year 5. Describe how those costs are reflected in Appendix A – Table 3A or 3B.**

**☒ Not applicable to this program because no additional library resources are needed to implement or sustain the proposed program.**

**C. Describe any specialized equipment and space currently available to implement and/or sustain the proposed program through Year 5.**

The Aero-propulsion, Mechatronics, and Energy (AME) center at FAMU-FSU College of Engineering was established in 2011. This 60,000-square-foot state-of-the-art facility supports advanced research in aerospace and aviation, mechatronics, and sustainable energy engineering. The AME center houses research laboratories, faculty and student offices, classrooms, and other infrastructures, which will be used for both teaching and research training of aerospace degree-seeking students. A brief description of selected facilities is given as follows.

***Aero-propulsion Centric Experimental Facilities:***
The Polysonic wind tunnel (PSWT) at FAMU-FSU College of Engineering is capable of operating in the Mach number regime of 0.2 to 5, including transonic speeds, and produces a unit Reynolds number of 2 – 30 million/ft. The facility features two separate test sections: 1) 12-in x 12-in x 24-in test section with solid walls for sub/supersonic Mach number testing, and 2) 12-in x 12-in x 48-in with slotted walls for testing in the transonic speed regime. Test models will be supported by a sting balance (six degree of freedom load cell) capable of pitch (-10° to 50°) and roll (±180°) during the blowdown. The PSWT is designed to produce excellent flow quality, which is achieved through 10:1 inlet contraction ratio, 5 fine mesh flow conditioning screens, flow straightener and settling chamber acoustic treatment. The facility is designed to operate at various Reynolds numbers at a fixed Mach number with the help of varying stagnation pressure and an ejector system. The facility has been calibrated over the entire operational regime and exhibits excellent flow quality. The rms pressure fluctuations at supersonic speed are less than 0.2%, turbulence intensity less than 0.2% and flow angularity over the entire measurement section is less than 0.2°, respectively. The facility is equipped to carry out shadowgraph (fluid density fluctuations), surface oil flow visualizations, steady and unsteady pressures, aerodynamic forces and moments, and flow diagnostic measurements. The facility is connected to a high-pressure storage system of 110$m^3$ of dry air at 500psia pressure. Typical run times are 30 - 100 seconds depending upon the test conditions.

The low-speed wind tunnel at FAMU-FSU is an open circuit facility with a square test section measuring 30-in x 30-in that extends 60-in in the flow direction. The facility is driven by an axial fan powered by a 150HP, direct drive AC induction motor. The motor is controlled by a Toshiba variable frequency drive that outputs a constant frequency power signal between 2 and 50 Hz. The range of freestream velocity is 2 m/s to 80 m/s and a corresponding maximum Reynolds number of 2.4 million/ft. To achieve flow uniformity

and low-turbulence (< 0.05%), the facility is designed and equipped with 9:1 contraction ratio, honeycomb inlet and three stainless steel meshes of appropriate porosity.

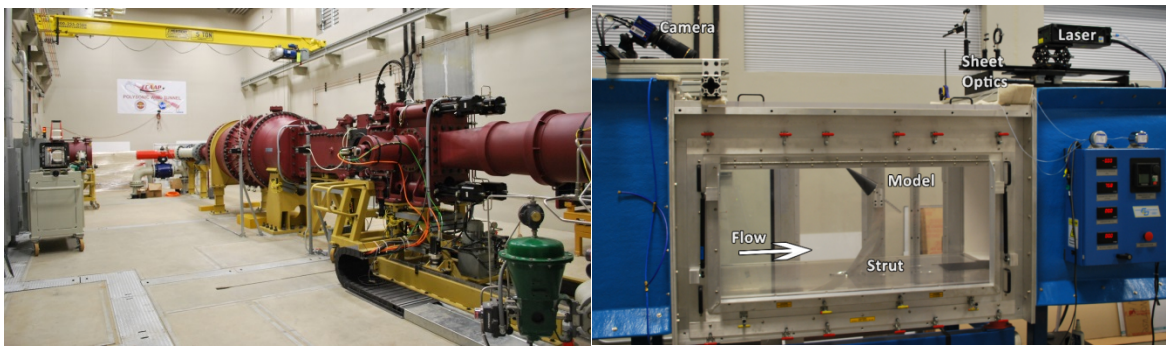



***Figure - The FAMU-FSU Polysonic Wind Tunnel (left) and the PIV setup in the low speed wind tunnel with a cone model (right).***

The wind tunnels are equipped with required instrumentation, including a six-component strain gauge balance to measure aerodynamic forces and moments, an electronic pressure scanner (ESP) for steady pressure distributions and Kulite pressure transducers for unsteady pressures. The facilities are designed for maximum optical access and with flow diagnostic capabilities such as Schlieren, shadowgraph and surface oil flow visualization measurement methods. The wind tunnels are also equipped for time-averaged and time-resolved PIV, including double pulsed Nd-YAG 400mJ/pulse laser, a 150W 30kHz photonics laser, cMOS / CCD cameras and necessary optics to measure off-body velocity field. We have also recently procured a fast-response Pressure Sensitive Paint (PSP) instrumentation to measure unsteady surface pressure fluctuations. Both of these facilities and advanced optical diagnostic techniques will be used in the proposed study.

In addition the center has a number of jet facilities to study jet noise and high-temperature material characterization, actuator development laboratory, a flow diagnostic development laboratory and a fully-equipped machine shop.

***Computational Facilities***:
The faculty has a number of well-validated, in-house, theoretical, and computational tools. These computational tools have two principal components: (a) the software that simulates the required physical fields of interest (denoted the “solver”), and (b) the software-suite that performs physical, statistical, and modal analyses on the simulated data (denoted the “post-processor”). A critical resource for the research includes the computational framework utilized by the solver and the post-processor. They are as follows:

Solver: The solver will be executed on the computational clusters at FAMU-FSU College of Engineering. Multi-core simulations thus obtained will be validated using complementary experiments and will serve as digital-twins for the flowfields studied. The common engineering-resource-pool nodes will be utilized for small-scale pilot simulations. For advanced simulations, the high-order capability of the solver facilitates superior resolution of the turbulent flowfields on reasonable grid-sizes of the order of 100-150 million. This will necessitate parallel computing on 600-800 cores, that will be provided by the RCC facility at FAMU and FSU. If needed, additional computing resources will be requested at the NSF-supported National Supercomputer Centers (see http://www.xsede.org) and the Department of Defense High-Performance Computing Centers.

Post-processor: This software-suite will be primarily executed on workstation computers utilized by the PIs and other personnel involved in this research. Three specialized workstations are available for this purpose, that can handle graphic-intensive data-interrogation, and memory-intensive long-time spectral and statistical signal analyses.

***Mechatronics – Robotics, Control and Intelligence Facilities:***
Mechatronics is the synergistic integration of mechanical, electrical, control, and computer systems to create functional products. The field of mechatronics generally covers topics such as robotics, Micro-Electro-Mechanical-Systems (MEMS), intelligent systems, automated guided vehicles, and smart materials. AME mechatronics group's research focuses on a variety of robot designs and control methodologies. A major challenge in this field pertains to exploitation of bio-inspired systems that can adapt to their surroundings while efficiently navigating cluttered and unpredictable terrains. This includes (1) legged robotics systems traversing up walls, across obstacles, swimming and diving underwater, etc.. (2) Human/Robotic Interactions and Biomechanics. (3) Bipedal robot locomotion and optimal control.

Detailed description of specialized instrumentation, manufacturing and diagnostics facilities of the mechatronics group can be found in the following web links: Center for Intelligent Systems, Control, and Robotics , and Optimal Robotics Laboratory.

***Aerospace-centric Materials Research Facilities*:** In addition to the AME center, aerospace engineering faculty and students will have access to aerospace-related materials research facilities and collaborators from High Performance Materials Institute (HPMI) with expertise in high-performance composite and nanomaterials, structural health monitoring, multifunctional nanomaterials advanced manufacturing and process modeling. HPMI has world-class facilities in materials processing, synthesis, thermal and mechanical testing, imaging and microscopy as well as outstanding capability in computational modeling and simulation. Detailed description of HPMI's specialized equipment and resources can be found in this link: Equipment | High-Performance Materials Institute.

***Cryogenics Facilities*:** Cryogenics is used to cool aviation components, and to store rocket fuel at extremely low temperatures, with liquid hydrogen and liquid oxygen being the most widely used fuel and oxidizer. The advancement of cryogenic thermal and fluid management technology is considered an integral part of the development of deep space exploratory missions. The FSU Cryogenics Laboratory is a fully developed 3000 $ft^2$ facility for the conduct of low temperature experimental research in fluid dynamics, heat transfer and materials characterization. The laboratory is housed at the National High Magnetic Field Laboratory (NHMFL), which is adjacent to the FAMU-FSU College of Engineering in Tallahassee, FL. These facilities include: Cryogenic Helium Experimental Facility, Liquid Helium Flow Visualization Facility, Laser Induced Fluorescence Imaging Facility, Cryogenic Magnetic Levitation Facility, Multi-layer Thermal Conductivity Measurement Facility, etc.. More detailed description of these facilities can be found in Cryogenics Lab.

**D. Describe any additional specialized equipment or space needed to implement and/or sustain the proposed program through Year 5. Include any projected Instruction and Research (I&R) costs of additional space in Appendix A – Table 3A or 3B. Costs for new construction should be provided in response to Section IX.E. below.**

**☒ Not applicable to this program because no new I&R costs are needed to implement or sustain the program through Year 5**

Although no new specialized equipment or space are requested, additional facilities and laboratory space are desired to sustain and grow the program beyond the first five years of the graduate program. These directions include additional graduate research thrusts (e.g., space applications, propulsion, combustion) and an undergraduate aerospace degree program. Critical research areas of national need that complement current expertise at the FAMU-FSU College of Engineering include aerospace structures, combustion technology, and liquid hydrogen research and test facilities. The latter aligns with a new hydrogen initiative. With respect to expansions to an undergraduate aerospace degree program, additional makerspace for aerospace structure design and development, and a cryogenics laboratory. The latter will take advantage of world-class resources and expertise (including mechanical engineering department professors) in the field of cryogenics. Moreover, this will offer opportunities to train undergraduates in the growing field of quantum information in science where superconductivity hardware is one of the main quantum computing hardware platforms. Furthermore, this is another strategic research thrust at FSU.

**E. If a new capital expenditure for instructional or research space is required, indicate where this item appears on the university's fixed capital outlay priority list. Appendix A – Table 3A or 3B includes only I&R costs. If non-I&R costs, such as indirect costs affecting libraries and student services, are expected to increase due to the program, describe and estimate those expenses in narrative form below. High enrollment programs, in particular, are expected to necessitate increased costs in non-I&R activities.**

**☒ Not applicable to this program because no new capital expenditures are needed to implement or sustain the program through Year 5.**

Similarly, no capital expenditures are requested here; however, investments that may need consideration to sustain the program include faculty start-up funds and a future research building for space and propulsion applications. Whereas the start of a strong AE graduate program can be created with existing facilities at the Aero-Propulsion, Mechatronics, and Energy Building located near the FAMU-FSU College of Engineering, these facilities focus on subsonic, transonic, supersonic and hypersonic (Mach ~5-6) fluid dynamics and robotic applications. An additional research building should be considered in the long term to expand the program to space applications. This will be important for the growth of the graduate program and the future development of an undergraduate program.

**F. Describe any additional special categories of resources needed to operate the proposed program through Year 5, such as access to proprietary research facilities, specialized services, or extended travel. Explain how those projected costs of special resources are reflected in Appendix A – Table 3A or 3B.**

**☒ Not applicable to this program because no additional special categories of resources are needed to implement or sustain the program through Year 5.**

**G. Describe fellowships, scholarships, and graduate assistantships to be**

**allocated to the proposed program through Year 5 and explain how those are reflected in Appendix A – Table 3A or 3B.**

**☐ Not applicable to this program because no fellowships, scholarships, and/or graduate assistantships will be allocated to the proposed program through Year 5.**

Fellowships and/or scholarships are proposed for the first year $50,000 and similarly $50,000 in the fifth year, to attract highly qualified U.S. students into the aerospace field. These funds will be a small fraction of the expected C&G funds that will support graduate students as shown in Table 3A. These funds will provide additional salaries for highly qualified PhD students at competitive rates to top AE programs within the U.S. The students will be selected by the graduate committee in the Mechanical Engineering Department with input from a faculty member's recommendations who intends to mentor and support the student with a base salary.

## X. Required Appendices

**The appendices listed in tables 1 & 2 below are required for all proposed degree programs except where specifically noted. Institutions should check the appropriate box to indicate if a particular appendix is included to ensure all program-specific requirements are met. Institutions may provide additional appendices to supplement the information provided in the proposal and list them in Table 2 below.**

**Table 1. Required Appendices by Degree Level**

| Appendix | Appendix Title | Supplemental Instructions | Included Yes/No | Required for Degree Program Level | | |
|---|---|---|---|---|---|---|
| | | | | Bachelors | Masters/ Specialist | Doctoral/ Professional |
| A | Tables 1-4 | | | X | X | X |
| B | Consultant's Report and Institutional Response | | | | | X |
| C | Academic Learning Compacts | Include a copy of the approved or proposed Academic Learning Compacts for the program | | X | | |
| D | Letters of Support or MOU from Other Academic Units | Required only for programs offered in collaboration with multiple academic units within the institution | | X | X | X |

| | | | | | | |
|---|---|---|---|---|---|---|
| E | Common Prerequisite Request Form | This form should also be emailed directly to the BOG Director of Articulation before submitting the program proposal to the Board office for review. | | X | | |
| F | Request for Exemption to the 120 Credit Hour Requirement | Required only for baccalaureate degree programs seeking approval to exceed the 120 credit hour requirement | | X | | |
| G | Request for Specialized Admissions Status | Required only for baccalaureate degree programs seeking approval for specialized admissions status | | X | | |
| H | Attestations for Self-Supporting and Market Tuition Rate Programs | Required only for self-supporting or market tuition rate programs | | | X | X |
| I | Faculty Curriculum Vitae | | | X | X | X |

**Table 2. Additional Appendices**

| Appendix | Appendix Title | Description |
|---|---|---|
| A | Faculty Participation | Faculty data |
| B | Program Collaborations | Email discussion with chairs |
| | | |

# Appendix B: Program Collaborations

**Provide supporting documentation in a separate attachment that serves as evidence that the new program will not supplant any existing similar or equivalent E&G degree offering. Describe the evidence in narrative form below. Note that Board Regulation 8.002 considers a program similar if it is offered under the same CIP code as one funded under the E&G budget entity.**

**The following is a correspondence between Dr. William S. Oates (Chair of Mechanical Engineering) and Dr. Warren Dixon, Chair of Mechanical and Aerospace Engineering at the University of Florida.**

Billy

Sorry for my delay. I spoke briefly to the dean yesterday for any inputs and he did not have much to say. I welcome any opportunities to help and to collaborate, even to open the idea of some kind of joint degree program, if that makes sense.

Dean's Leadership Professor and Department Chair
Department of Mechanical and Aerospace Engineering
University of Florida

On Feb 6, 2024, at 3:02 PM, William Oates <woates@eng.famu.fsu.edu> wrote:

**[External Email]**
Hi Warren,

I just wanted to follow up to see if you had any thoughts on us pursuing an aerospace PhD program here at FAMU-FSU.

Cheers,
Billy
--

William S. Oates, Ph.D., P.E.
Cummins, Inc. Professor of Engineering
Department of Mechanical Engineering
Florida A&M / Florida State University
Tallahassee, FL 32310-6046
USA
www.eng.fsu.edu/~woates
phone: (850) 410-6373
fax: (850) 410-6337

**From:** William Oates <woates@eng.famu.fsu.edu>
**Sent:** Thursday, February 1, 2024 12:15 PM
**To:** Warren Dixon <wdixon@ufl.edu>
**Subject:** aerospace PhD program @ FAMU-FSU

Hi Warren,

I hope all is going well. I'm interested in getting your feedback on a proposal I'm putting together for our department. I've been working with our faculty to extend our ME PhD program to include a PhD program on aerospace engineering. I want to make sure it doesn't impact the program at UF. I also hope it will strengthen future collaborative opportunities through FCAAP like our on-going AFOSR COE.

If you have any suggestions or would like to discuss any particular ideas, please let me know.

Best regards,
Billy

--

William S. Oates, Ph.D., P.E.
Cummins, Inc. Professor of Engineering
Department of Mechanical Engineering
Florida A&M / Florida State University
Tallahassee, FL 32310-6046
USA
www.eng.fsu.edu/~woates

phone: (850) 410-6373
fax: (850) 410-6337

**The following correspondence is between Dr. William S. Oates (Chair of Mechanical Engineering) and Dr. Yoav Peles, Chair of Mechanical and Aerospace Engineering at the University of Central Florida.**

Hi Billy,

Many thanks for letting us know. Please let us know if you need help (e.g., letter of support, input, etc.). Good luck with the proposal.

Yoav

**From:** William Oates <woates@eng.famu.fsu.edu>
**Sent:** Thursday, February 1, 2024 12:56 PM
**To:** Yoav Peles <Yoav.Peles@ucf.edu>
**Subject:** aerospace graduate program, FAMU-FSU

Dear Dr. Peles,

I'm hoping you can give me any feedback on a proposal I'm putting together for our department. I've been working with our faculty to extend our ME PhD program to include a graduate program on aerospace engineering. I want to make sure it doesn't impact the aerospace graduate program at UCF. I also hope it will strengthen future collaborative opportunities through our FCAAP network with state universities.

If you have any suggestions or would like to discuss any particular ideas, please let me know.

Best regards,
Billy

--

William S. Oates, Ph.D., P.E.
Cummins, Inc. Professor of Engineering
Department of Mechanical Engineering
Florida A&M / Florida State University
Tallahassee, FL 32310-6046
USA
www.eng.fsu.edu/~woates

phone: (850) 410-6373
fax: (850) 410-6337

Syracuse University
College of Engineering
& Computer Science

# External Review of a Proposal by Florida State University for the establishment of a graduate degree program in Aerospace Engineering

Mark Glauser
Professor Emeritus of Mechanical and Aerospace Engineering
Syracuse University
April 26, 2024

This is my review of the Florida A&M and Florida State Universities proposal to offer a graduate degree program in Aerospace Engineering (AE) beginning Spring 2025. The graduate program will offer master's and doctoral degrees. The proposed program will be offered jointly within the FAMU-FSU College of Engineering and operate within the FAMU-FSU Mechanical Engineering Department. This review was conducted to judge compliance with the Florida Board of Governors New Degree Criteria.

This is an excellent proposal that is timely and well written which addresses all the Board of Governors' criteria. Both qualitative and quantitative material is provided that demonstrates that the proposal meets all the criteria. The proposal to have this program housed in the Mechanical Engineering Department is the proper choice given the current extensive ongoing research in that department that is Aerospace related. This will significantly enhance FAMU-FSUs already well -respected reputation in the Aerospace sector. We at Syracuse University have recently hired 2 recent Ph.D. graduates from the FAMU-FSU Mechanical Engineering program as Assistant Professors in our Aerospace Engineering program (Professors Yiyang Sun and Fernando Zigunov) due to their outstanding research and education in the Aerospace area. Having these two colleagues graduate with Ph.D. degrees in Aerospace Engineering would have made their hiring to support our Aerospace Engineering program somewhat easier. This is due to the fact some of my colleagues were unsure if Professors Sun and Zigunov were sufficiently trained in Aerospace Engineering to be hired into our Aerospace Engineering program. Given my knowledge of the significant level of depth in the Aerospace discipline within the FAMU-FSU Mechanical Engineering Department, I was able to dispel the concerns of my colleagues and we moved forward hiring them as Assistant Professors in Aerospace Engineering. The proposed graduate degree program in Aerospace Engineering will make this a non-issue.

What the FAMU-FSU Mechanical Engineering faculty are asking for is the opportunity to have their graduate students whose main research focus is in the Aerospace area graduate with the degree that is more in line with their expertise. It could be argued that this is more a matter of marketing and packaging than establishing an entirely new program from scratch. Leveraging the already outstanding research and education in the Aerospace discipline within the FAMU-

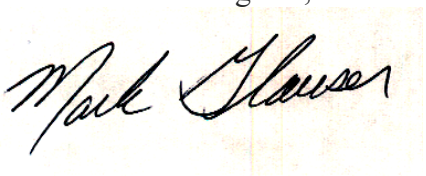
**Department of Mechanical and Aerospace Engineering**
263 Link Hall, Syracuse, NY 13244 **T** 3152440882 **E** mglauser@syr.edu

FSU Mechanical Engineering program explains the relatively minor cost of the new proposed graduate degree program in Aerospace Engineering.

The Board of Governors is concerned about duplication in the state. This is not an issue in this case. As pointed out in the proposal, the AE program at FAMU and FSU will complement the other two programs in the state at UF and UCF (see Appendix B) and advance the State and Federal calls to increase competence in science, technology, engineering, and math (STEM) in upcoming generations and to promote advanced aerospace engineering to solve fundamental problems that have immediate technical applications. In Florida, the aerospace industry is an essential component of the State's economy. Furthermore, there are several federal research laboratories in the Panhandle region, including Eglin and Tyndall Air Force Bases, the Naval Surface Warfare Center—Panama City Division and the Naval Air Station in Pensacola, that need new, well-trained AE graduates in their workforce. In addition, many industries in Florida, like defense and aerospace contractors, need aerospace engineers at the master's and doctoral level. The need for the AE graduate degree program is clearly justified. Let me give some perspective from the State of New York. Our Aerospace sector in New York is significantly smaller than that of Florida and we don't even come close to having the federal facilities that engage in the Aerospace sector that Florida has. Note however, that within New York State we have several Aerospace graduate degree programs including Syracuse University, Cornell University, RPI, Clarkson and the University at Buffalo/SUNY. Given the level of activity in the State of Florida within the Aerospace sector, adding an additional graduate degree program in AE at FAMU-FSU is the proper and timely thing to do.

I believe this is an excellent proposal that the Board of Governors should feel highly confident in approving. Feel free to reach out to me at mglauser@syr.edu or 315 244 0882 (cell) if you would like additional input.

With Best Personal Regards,



Mark Glauser
Emeritus and Research Professor of
Mechanical and Aerospace Engineering
College of Engineering and Computer Science
Fellow; AIAA, APS, ASME, Institute of Physics (UK)
Member, Army Science Board 2013 - 2021

# APPENDIX A

## TABLE 1-B

## PROJECTED HEADCOUNT FROM POTENTIAL SOURCES

## (MS+PhD Graduate Degree Programs)

| Source of Students (Non-duplicated headcount in any given year)* | Year 1 HC | Year 1 FTE | Year 2 HC | Year 2 FTE | Year 3 HC | Year 3 FTE | Year 4 HC | Year 4 FTE | Year 5 HC | Year 5 FTE |
|---|---|---|---|---|---|---|---|---|---|---|
| Individuals drawn from agencies/industries in your service area (e.g., older returning students) | 2 | 1 | 3 | 1 | 3 | 3 | 1 | 1 | 3 | 3 |
| Students who transfer from other graduate programs within the university** | 4 | 4 | 4 | 2 | 4 | 2 | 2 | 2 | 2 | 2 |
| Individuals who have recently graduated from preceding degree programs at this university | 6 | 4 | 12 | 10 | 4 | 12 | 10 | 19 | 12 | 10 |
| Individuals who graduated from preceding degree programs at other Florida public universities | 6 | 4 | 12 | 10 | 19 | 15 | 26 | 22 | 26 | 20 |
| Individuals who graduated from preceding degree programs at non-public Florida institutions | 7 | 5 | 14 | 12 | 21 | 16 | 28 | 23 | 32 | 26 |
| Additional in-state residents*** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Additional out-of-state residents*** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Additional foreign residents*** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other (Explain)*** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Totals** | **25** | **18** | **45** | **35** | **51** | **48** | **67** | **67** | **75** | **61** |

* List projected annual headcount of students enrolled in the degree program. List projected yearly cumulative ENROLLMENTS instead of admissions.

** If numbers appear in this category, they should go DOWN in later years.

*** Do not include individuals counted in any PRIOR category in a given COLUMN.

# APPENDIX A

## Table 2

## Anticipated Faculty Participation

| Faculty Code | Faculty Name or "New Hire" Highest Degree Held Academic Discipline or Specialty | Rank | Contract Status | Initial Date for Participation in Program | Mos. Contract Year 1 | FTE Year 1 | % Effort for Prg. Year 1 | PY Year 1 | Mos. Contract Year 5 | FTE Year 5 | % Effort for Prg. Year 5 | PY Year 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | Rajan Kumar, PhD<br>Mechanical Engineering | Full Prof | Tenure | Fall 2025 | 9 | 0.75 | 0.10 | 0.08 | 9 | 0.75 | 0.20 | 0.15 |
| A | Yousuf Ali, Ph.D.<br>Mechanical Engineering | Instructor | MYA | Fall 2025 | 12 | 1.00 | 0.10 | 0.10 | 12 | 1.00 | 0.18 | 0.18 |
| A | Chiang Shih, PhD<br>Mechanical Engineering | Full Prof | Tenure | Fall 2025 | 9 | 0.75 | 0.10 | 0.08 | 9 | 0.75 | 0.00 | 0.00 |
| A | William Oates, PhD<br>Mechanical Engineering | Full Prof | Tenure | Fall 2025 | 9 | 0.75 | 0.15 | 0.11 | 9 | 0.75 | 0.20 | 0.15 |
| A | Farrukh Alvi, PhD<br>Mechanical Engineering | Full Prof | Tenure | Fall 2025 | 12 | 1.00 | 0.05 | 0.05 | 12 | 1.00 | 0.05 | 0.05 |
| A | Huixuan Wu, PhD<br>Mechanical Engineering | Prof | Tenure | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.18 | 0.14 |
| A | Alex Berger, PhD<br>Aerospace Engineering | Prof | track | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.13 | 0.10 |
| A | Kourosh Shoele, PhD<br>Mechanical Engineering | Prof | Tenure | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.15 | 0.11 |
| A | Neda Yaghoobian, PhD<br>Mechanical Engineering | Prof | Tenure | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.12 | 0.09 |
| A | Jizhe Cai, PhD<br>Aerospace Engineering | Prof | track | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.15 | 0.11 |
| A | Christian Hubicki, PhD<br>Mechanical Engineering | Prof | track | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.15 | 0.11 |
| A | Unni Nair, PhD<br>Mechanical Engineering | Prof | track | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.15 | 0.11 |
| A | Wei Guo, PhD<br>Physics | Full Prof | Tenure | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.12 | 0.09 |
| A | Juan Ordonez, PhD<br>Mechanical Engineering | Full Prof | track | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.10 | 0.08 |
| A | Carl Moore, PhD<br>Mechanical Engineering | Prof | track | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.10 | 0.08 |

# APPENDIX A

## Table 2

## Anticipated Faculty Participation

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | David Larbalestier, PhD Engineering | Full Prof | track | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.00 | 0.00 |
| A | Eric Hellstrom, PhD Engineering | Full Prof | track | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.00 | 0.00 |
| A | Brandon Krick, PhD Mechanical Engineering | Prof | track | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.15 | 0.11 |
| A | Fumitake Kametani, PhD Engineering | Prof | track | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.05 | 0.04 |
| B | New Hire, PhD Engineering | Prof | track | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.20 | 0.15 |
| B | New Hire, PhD Engineering | Prof | Tenured | Fall 2025 | 9 | 0.75 | 0.05 | 0.04 | 9 | 0.75 | 0.20 | 0.15 |
| C | New Hire, PhD Engineering | Prof | Tenured | Fall 2026 | 0 | 0.00 | 0.00 | 0.00 | 9 | 0.75 | 0.30 | 0.23 |
| C | New Hire, PhD Engineering | Prof | track | Fall 2026 | 0 | 0.00 | 0.00 | 0.00 | 12 | 1.00 | 0.30 | 0.30 |
| C | New Hire, PhD Engineering | Prof | track | Fall 2027 | 0 | 0.00 | 0.00 | 0.00 | 9 | 0.75 | 0.30 | 0.23 |
| C | New Hire, PhD Engineering | Prof | track | Fall 2027 | 0 | 0.00 | 0.00 | 0.00 | 9 | 0.75 | 0.30 | 0.23 |
| C | New Hire, PhD Engineering | Prof | MYA | Fall 2027 | 0 | 0.00 | 0.00 | 0.00 | 12 | 1.00 | 0.05 | 0.05 |
| C | New Hire, PhD Engineering | Prof | MYA | Fall 2028 | 0 | 0.00 | 0.00 | 0.00 | 12 | 1.00 | 0.05 | 0.05 |
| C | New Hire, PhD Engineering | Prof | MYA | Fall 2028 | 0 | 0.00 | 0.00 | 0.00 | 12 | 1.00 | 0.05 | 0.05 |
| | **Total Person-Years (PY)** | | | | | | | **1.01** | | | | **3.12** |

| Faculty Code | Code Description | Source of Funding | PY Workload by Budget Classification | | |
|---|---|---|---|---|---|
| | | | Year 1 | | Year 5 |
| A | Existing faculty on a regular line | Current Education & General Revenue | 0.94 | | 1.69 |
| B | New faculty to be hired on a vacant line | Current Education & General Revenue | 0.08 | | 0.30 |
| C | New faculty to be hired on a new line | New Education & General Revenue | 0.00 | | 1.13 |
| D | Existing faculty hired on contracts/grants | Contracts/Grants | 0.00 | | 0.00 |

# APPENDIX A

## Table 2

## Anticipated Faculty Participation

| | | | | | |
|---|---|---|---|---|---|
| E | New faculty to be hired on contracts/grants | Contracts/Grants | 0.00 | | 0.00 |
| F | Existing faculty on endowed lines | Philanthropy & Endowments | 0.00 | | 0.00 |
| G | New faculty on endowed lines | Philanthropy & Endowments | 0.00 | | 0.00 |
| H | Existing or new faculty teaching outside of regular/tenure-track line course load | Enterprise Auxiliary Funds | 0.00 | | 0.00 |
| | | **Overall Totals for** | **1.01** | | **3.12** |

# APPENDIX A

## TABLE 4

## ANTICIPATED REALLOCATION OF EDUCATION GENERAL FUNDS*

| Program and/or E&G account from which current funds will be reallocated during Year 1 | Base before reallocation | Amount to be reallocated | Base after reallocation |
|---|---|---|---|
| Mechanical Engineering Budget 218000110 | $3,534,076 | $307,825 | **$3,226,251** |
| | $0 | $0 | **$0** |
| | $0 | $0 | **$0** |
| | $0 | $0 | **$0** |
| | $0 | $0 | **$0** |
| | $0 | $0 | **$0** |
| | $0 | $0 | **$0** |
| | $0 | $0 | **$0** |
| **Totals** | $3,534,076 | $307,825 | **$3,226,251** |

*** If not reallocating E&G funds, please submit a zeroed Table 4**

# APPENDIX A

## TABLE 3A

## EROLLMENT AND GROWTH

## PROJECTED COSTS AND FUNDING SOURCES

Institutions should not edit the categories or budget lines in the table below. This table is specific to state-funded (E&G) programs, and institutions are expected to explain all costs and funding sources in Section VII.A. of the proposal. Detailed definitions for each funding category are located at the bottom of the table.

| Budget Line Item | Reallocated Base* (E&G) Year 1 | Enrollment Growth (E&G) Year 1 | New Recurring (E&G) Year 1 | New Non-Recurring (E&G) Year 1 | Contracts & Grants (C&G) Year 1 | Philanthropy/ Endowments Year 1 | Other Funding Year 1 - Please Explain in Section VII.A. of the Proposal | **Subtotal Year 1** | Continuing Base** (E&G) Year 5 | New Enrollment Growth (E&G) Year 5 | Other*** (E&G) Year 5 | Contracts & Grants (C&G) Year 5 | Philanthropy/ Endowments Year 5 | Other Funding Year 5 - Please Explain in Section VII.A. of the Proposal | **Subtotal Year 5** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Salaries and Benefits (Faculty) | 237,825 | 0 | 0 | 0 | 91,374 | 0 | 0 | **$329,199** | 588,375 | 0 | 0 | 231,770 | 0 | 0 | **$820,144** |
| Salaries and Benefits (A&P and USPS) | 10,000 | 0 | 0 | 0 | 0 | 0 | 0 | **$10,000** | 50,000 | 0 | 0 | 0 | 0 | 0 | **$50,000** |
| OPS (including assistantships & fellowships) | 50,000 | 0 | 0 | 0 | 274,122 | 0 | 0 | **$324,122** | 50,000 | 0 | 0 | 695,309 | 0 | 0 | **$745,309** |
| Programmatic Expenses**** | 10,000 | 0 | 0 | 0 | 91,374 | 0 | 0 | **$101,374** | 15,000 | 0 | 0 | 231,770 | 0 | 0 | **$246,770** |
| **Total Costs** | **$307,825** | **$0** | **$0** | **$0** | **$456,871** | **$0** | **$0** | **$764,696** | **$703,375** | **$0** | **$0** | **$1,158,849** | **$0** | **$0** | **$1,862,223** |

*Identify reallocation sources in Table 4.

**Includes recurring E&G funded costs ("reallocated base," "enrollment growth," and "new recurring") from Years 1-4 that continue into Year 5.

***Identify if non-recurring.

****include library costs, expenses, OCO, special categories, etc.

**Faculty and Staff Summary**

| Total Positions | Year 1 | Year 5 |
|---|---|---|
| Faculty (person-years) | 1.01 | 3.12 |
| FTE (A&P and USPS) | 0.3 | 1 |

**Calculated Cost per Student FTE**

| | Year 1 | Year 5 |
|---|---|---|
| Total E&G Funding | $307,825 | $703,375 |
| Annual Student FTE | 18 | 61 |
| E&G Cost per FTE | $17,101 | $11,531 |

**Table 3 Column Explanations**

| | | |
|---|---|---|
| Reallocated Base* (E&G) | 1 | E&G funds that are already available in the university's budget and will be reallocated to support the new program. Please include these funds in the Table 4 – Anticipated reallocation of E&G funds and indicate their source. |
| Enrollment Growth (E&G) | 2 | Additional E&G funds allocated from the "Student and Other fees Tust Fund" contingent on enrollment increases. |
| New Recurring (E&G) | 3 | Recurring funds appropriated by the Legislature to support implementation of the program. |
| New Non-Recurring (E&G) | 4 | Non-recurring funds appropriated by the Legislature to support implementation of the program. Please provide an explanation of the source of these funds in the budget section (section VII.A.) of the proposal. These funds can include initial investments, such as infrastructure. |
| Contracts & Grants (C&G) | 5 | Contracts and grants funding available for the program. |
| Philanthropy Endowments | 6 | Funds provided through the foundation or other Direct Support Organizations (DSO) to support the program. |
| Continuing Base** (E&G) | 7 | Includes the sum of columns 1, 2, and 3 over time. |
| New Enrollment Growth (E&G) | 8 | See explanation provided for column 2. |
| Other*** (E&G) | 9 | These are specific funds provided by the Legislature to support implementation of the program. |
| Contracts & Grants (C&G) | 10 | See explanation provided for column 5. |
| Philanthropy Endowments | 11 | See explanation provided for column 6. |
| Other Funding | 12 | Any funding sources not already covered in any other column of the table. Please provide an explanation for any funds listed in these columns in the narrative for Section VII.A. of the proposal. |

FLORIDA A&M UNIVERSITY

**Board of Trustees**
**ACTION ITEM**

**Academic and Student Affairs Committee**
**Monday, May 20, 2024**
**Agenda Item: X**

**Subject:** Tenure

**Proposed Board Action:** Applications for tenure were reviewed by the departments, the colleges/schools, the University Tenure and Promotion Committee, Provost Watson, and President Robinson. The applicants were evaluated based on their professional experiences, teaching effectiveness, university service, public service, demonstrated contributions to their teaching discipline, technical and performance competencies, records of publications and research, certifications and exceptional scholarly or creative activities.

**Attachments:** No

| | Candidate Name | College/School | Department/Division | Levels of Internal Review |
|---|---|---|---|---|
| | | | | |
| 1 | Sarah Buxbaum | College of Pharmacy and Pharmaceutical Sciences_ Institute of Public Health (COPPS_IPH) | Epidemiology and Biostatistics | - Tenured Faculty<br>- College T&P Committee<br>- Dean's Review<br>- University T&P Committee<br>- Provost |
| 2 | Fatimah Sherbeny | College of Pharmacy and Pharmaceutical Sciences_ Institute of Public Health (COPPS_IPH) | Economic, Social and Administrative Pharmacy | - Tenured Faculty<br>- College T&P Committee<br>- Dean's Review<br>- University T&P Committee<br>- Provost |

FLORIDA A&M UNIVERSITY

**Board of Trustees**

**ACTION ITEM**

| | Candidate Name | College/School | Department/Division | Levels of Internal Review |
|---|---|---|---|---|
| 3 | Lee Bushong | College of Social Sciences, Arts and Humanities | Sociology and Criminal Justice | - Department T&P Committee<br>- Department Chair<br>- College T&P Committee<br>- Dean's Review<br>- University T&P Committee<br>- Provost |
| 4 | Nkechinyelum Chioneso | College of Social Sciences, Arts and Humanities | Psychology | - Department T&P Committee<br>- Department Chair<br>- College T&P Committee<br>- Dean's Review<br>- University T&P Committee<br>- Provost |
| 5 | Tiffany Packer | College of Social Sciences, Arts and Humanities | History and Political Sciences | - Department T&P Committee<br>- Department Chair<br>- College T&P Committee<br>- Dean's Review<br>- University T&P Committee<br>- Provost |
| 6 | Abdul Sharif | College of Social Sciences, Arts and Humanities | History and Political Sciences | - Department T&P Committee<br>- Department Chair<br>- College T&P Committee<br>- Dean's Review<br>- University T&P Committee<br>- Provost |

FLORIDA A&M UNIVERSITY

**Board of Trustees**

**ACTION ITEM**

| | Candidate Name | College/School | Department/Division | Levels of Internal Review |
|---|---|---|---|---|
| 7 | Mozhgan Entekhabi | College of Science and Technology | Mathematics | - Department T&P Committee<br>- Department Chair<br>- College T&P Committee<br>- Dean's Review<br>- University T&P Committee<br>- Provost |
| 8 | Anosh Gill | School of Journalism and Graphic Communication | Graphic Communication | - School T&P Committee<br>- Dean's Review<br>- University T&P Committee<br>- Provost |
| 9 | Hsuan Huang | School of Journalism and Graphic Communication | Public Relations | - School T&P Committee<br>- Dean's Review<br>- University T&P Committee<br>- Provost |
| 10 | Odell Stroud | School of Allied Health Sciences | Healthcare Management | - School T&P Committee<br>- Dean's Review<br>- University T&P Committee<br>- Provost |

FLORIDA A&M UNIVERSITY

**Board of Trustees**

**ACTION ITEM**

| | Candidate Name | College/School | Department/Division | Levels of Internal Review |
|---|---|---|---|---|
| 11 | Omolola Betiku | College of Agriculture and Food Science | Agricultural Science | - Tenured Faculty<br>- College T&P Committee<br>- Associate Dean's Review<br>- Dean's Review<br>- University T&P Committee<br>- Provost |
| 12 | Anthony Ananga | College of Agriculture and Food Science | Food Science | - Tenured Faculty<br>- College T&P Committee<br>- Associate Dean's Review<br>- Dean's Review<br>- University T&P Committee<br>- Provost |

FLORIDA A&M UNIVERSITY

**Board of Trustees**
**INFORMATION ITEM**

**Academic and Student Affairs Committee**
**Monday, May 20, 2024**
**Agenda Item: XI**

**Subject:** Student Affairs Update

**Background Information and Summary:** An update on the Division of Student Affairs.

FLORIDA A&M UNIVERSITY

**Board of Trustees**
**INFORMATION ITEM**

**Academic and Student Affairs Committee**
**Monday, May 20, 2024**
**Agenda Item: XII**

**Subject:** Academic Affairs Update

**Background Information and Summary:** An update on the Division of Academic Affairs.

# Academic Program Prioritization Update

| | |
|---|---|
| Year One (2021-22) | **Planning and Model Development**<br>Focus Areas: enrollment, retention rates, graduation rates, student credit hours, faculty productivity, external funding, cost. |
| Year Two (2022-23) | **Data Analysis and Ranking**<br>Ranked all programs 1 – 96<br>Program Improvement Workshop and Improvement Plans |
| Year Three (2023-24) | **Curricula Reform and Redesign**<br>Curriculum Workshop I - Undergraduate Programs<br>Curriculum Workshop II - Doctoral Degree Programs<br>Curriculum Workshop III - Undergraduate Programs Part II<br>Curriculum Workshop IV - New Program Development and Programs of Strategic Emphasis |

**Outcomes to Date**

Curricula Enhancements

Addition of Online and High Demand Programs to Increase

Enrollment and Degree Productivity

Conversion and/or Termination of Program Majors

Undergraduate Program Enhancements

# Overall Rankings

| Position | Program name |
|---|---|
| 1 | Doctor of Pharmacy |
| 2 | Bachelor of Science in Pharmaceutical Sciences |
| 3 | Master of Science in Community Psychology |
| 4 | Bachelor of Science in Biomedical Engineering |
| 5 | Bachelor of Science in Information Technology |
| 6 | Master of Science in Health Care Administration |
| 7 | Doctor of Philosophy in Pharmaceutical Sciences |
| 8 | Master of Science / Master of Education in Counselor Education |
| 9 | Doctor of Public Health |
| 10 | Master of Public Health |
| 11 | Bachelor of Science in Chemistry |
| 12 | Doctor of Physical Therapy |
| 13 | Master of Science in Sport Management |
| 14 | Bachelor of Science in Health Care Management |
| 15 | Master of Science in Nursing |
| 16 | Master of Science in Agricultural Science |
| 17 | Bachelor of Science in Cardiopulmonary Science |
| 18 | Bachelor of Science in Health Informatics and Information Management |
| 19 | Bachelor of Social Work |
| 20 | Master of Science in Occupational Therapy |
| 21 | Bachelor of Science in Biology |
| 22 | Bachelor of Science/Bachelor of Arts in Theatre |
| 23 | Bachelor of Science in Supply Chain Management |
| 24 | Master of Science in Supply Chain Management |
| 25 | Master of Social Work |
| 26 | Bachelor of Science/Bachelor of Arts in History |
| 27 | Master of Science in Biology |
| 28 | Master of Science in Biomedical Engineering |
| 29 | Bachelor of Science/Bachelor of Arts in Psychology |
| 30 | Master of Applied Social Sciences |
| 31 | Master of Business Administration |
| 32 | Bachelor of Criminal Justice |
| 33 | Doctor of Philosophy in Mechanical Engineering |
| 34 | Master of Education in Curriculum and Instruction |
| 35 | Bachelor of Science/Bachelor of Arts in Interdisciplinary Studies |
| 36 | Bachelor of Science in Computer Information Systems |
| 37 | Bachelor of Science in Computer Science |
| 38 | Bachelor of Science/Bachelor of Arts in Health, Physical Education/Fitness |
| 39 | Bachelor of Science in Health Science |
| 40 | Doctor of Philosophy in Biomedical Engineering |
| 41 | Doctor of Philosphy in Environmental Science |
| 42 | Bachelor of Science in Accounting |
| 43 | Master of Science in Mechanical Engineering |
| 44 | Bachelor of Science in Nursing |
| 45 | Juris Doctor |
| 46 | Master of Science in Electrical Engineering |
| 47 | Bachelor of Science in Business Administration |
| 48 | Doctor of Philosophy in Industrial Engineering |
| 49 | Bachelor of Science/Bachelor of Arts in Sociology |
| 50 | Bachelor of Science/Bachelor of Arts in Political Science |
| 51 | Master of Science in Environmental Science |
| 52 | Bachelor of Science in Agricultural Science |
| 53 | Doctor of Philosophy in Chemical Engineering |
| 54 | Master of Science in Chemistry |
| 55 | Bachelor of Science/Bachelor of Arts in Music |
| 56 | Doctor of Philosophy in Electrical Engineering |
| 57 | Bachelor of Science in Industrial Engineering |
| 58 | Master of Science in Pharmaceutical Sciences |
| 59 | Bachelor of Science in Chemical Engineering |
| 60 | Master of Science in Industrial Engineering |
| 61 | Master of Science/Master of Engineering in Civil Engineering |
| 62 | Master of Science in Chemical Engineering |
| 63 | Doctor of Philosophy in Civil Engineering |
| 64 | Bachelor of Arts in English |
| 65 | Bachelor of Science in Mathematics |
| 66 | Bachelor of Science in Construction Engineering Technology |
| 67 | Bachelor of Science in Electronic Engineering Technology |
| 68 | Master of Architecture |
| 69 | Bachelor of Science/Bachelor of Arts in Philosophy & Religion |
| 70 | Bachelor of Science in Civil Engineering |
| 71 | Bachelor of Science in Public Relations |
| 72 | Bachelor of Science in Computer Engineering |
| 73 | Master of Science in Architecture |
| 74 | Bachelor of Science/Bachelor of Arts in Economics |
| 75 | Bachelor of Science in Mechanical Engineering |
| 76 | Doctor of Philosophy in Physics |
| 77 | Bachelor of Science/Bachelor of Arts in Fine Arts |
| 78 | Bachelor of Science in Electrical Engineering |
| 79 | Bachelor of Science in Architectural Studies |
| 80 | Master of Science in Physics |
| 81 | Bachelor of Science in PreK/Elementary Education |
| 82 | Doctor of Philosophy in Educational Leadership |
| 83 | Bachelor of Architecture |
| 84 | Bachelor of Science in Physics |
| 85 | Bachelor of Science in Food Science |
| 86 | Bachelor of Science in Secondary Education and Teaching |
| 87 | Bachelor of Science in Journalism |
| 88 | Bachelor of Science/Bachelor of Arts in Environmental Studies |
| 89 | Bachelor of Science/Bachelor of Arts in African-American Studies |
| 90 | Bachelor of Science in Graphic Design |
| 91 | Master of Science in Computer Information Sciences |
| 92 | Bachelor of Science in Biological & Agricultural Systems Engineering |
| 93 | Bachelor of Science in Environmental Science |
| 94 | Bachelor of Science in Agribusiness |
| 95 | Bachelor of Science in Music Education |
| 96 | Master of Science / Master of Education in Educational Leadership |

# Bachelors' Program Rankings

| Rank (Bachelor's) | Overall Rank | Program Name |
|---|---|---|
| 1 | 2 | Bachelor of Science in Pharmaceutical Sciences |
| 2 | 4 | Bachelor of Science in Biomedical Engineering |
| 3 | 5 | Bachelor of Science in Information Technology |
| 4 | 11 | Bachelor of Science in Chemistry |
| 5 | 14 | Bachelor of Science in Health Care Management |
| 6 | 17 | Bachelor of Science in Cardiopulmonary Science |
| 7 | 18 | Bachelor of Science in Health Informatics and Information Management |
| 8 | 19 | Bachelor of Social Work |
| 9 | 21 | Bachelor of Science in Biology |
| 10 | 22 | Bachelor of Science/Bachelor of Arts in Theatre |
| 11 | 23 | Bachelor of Science in Supply Chain Management |
| 12 | 26 | Bachelor of Science/Bachelor of Arts in History |
| 13 | 29 | Bachelor of Science/Bachelor of Arts in Psychology |
| 14 | 32 | Bachelor of Criminal Justice |
| 15 | 35 | Bachelor of Science/Bachelor of Arts in Interdisciplinary Studies |
| 16 | 36 | Bachelor of Science in Computer Information Systems |
| 17 | 37 | Bachelor of Science in Computer Science |
| 18 | 38 | Bachelor of Science/Bachelor of Arts in Health, Physical Education/Fitness |
| 19 | 39 | Bachelor of Science in Health Science |
| 20 | 42 | Bachelor of Science in Accounting |
| 21 | 44 | Bachelor of Science in Nursing |
| 22 | 47 | Bachelor of Science in Business Administration |
| 23 | 49 | Bachelor of Science/Bachelor of Arts in Sociology |
| 24 | 50 | Bachelor of Science/Bachelor of Arts in Political Science |
| 25 | 52 | Bachelor of Science in Agricultural Science |

| Rank (Bachelor's) | Overall Rank | Program Name |
|---|---|---|
| 26 | 55 | Bachelor of Science/Bachelor of Arts in Music |
| 27 | 57 | Bachelor of Science in Industrial Engineering |
| 28 | 59 | Bachelor of Science in Chemical Engineering |
| 29 | 64 | Bachelor of Arts in English |
| 30 | 65 | Bachelor of Science in Mathematics |
| 31 | 66 | Bachelor of Science in Construction Engineering Technology |
| 32 | 67 | Bachelor of Science in Electronic Engineering Technology |
| 33 | 69 | Bachelor of Science/Bachelor of Arts in Philosophy & Religion |
| 34 | 70 | Bachelor of Science in Civil Engineering |
| 35 | 71 | Bachelor of Science in Public Relations |
| 36 | 72 | Bachelor of Science in Computer Engineering |
| 37 | 74 | Bachelor of Science/Bachelor of Arts in Economics |
| 38 | 75 | Bachelor of Science in Mechanical Engineering |
| 39 | 77 | Bachelor of Science/Bachelor of Arts in Fine Arts |
| 40 | 78 | Bachelor of Science in Electrical Engineering |
| 41 | 79 | Bachelor of Science in Architectural Studies |
| 42 | 81 | Bachelor of Science in PreK/Elementary Education |
| 43 | 83 | Bachelor of Architecture |
| 44 | 84 | Bachelor of Science in Physics |
| 45 | 85 | Bachelor of Science in Food Science |
| 46 | 86 | Bachelor of Science in Secondary Education and Teaching |
| 47 | 87 | Bachelor of Science in Journalism |
| 48 | 88 | Bachelor of Science/Bachelor of Arts in Environmental Studies |
| 49 | 89 | Bachelor of Science/Bachelor of Arts in African-American Studies |
| 50 | 90 | Bachelor of Science in Graphic Design |
| 51 | 92 | Bachelor of Science in Biological & Agricultural Systems Engineering |
| 52 | 93 | Bachelor of Science in Environmental Science |
| 53 | 94 | Bachelor of Science in Agribusiness |
| 54 | 95 | Bachelor of Science in Music Education |

May 2024

Florida A&M University | College of Law

# Plan of Action for Sustained Success (P.A.S.S)

Cecil Howard
Associate Provost & Interim Dean

FAMU | FLORIDA AGRICULTURAL AND MECHANICAL UNIVERSITY

# TOPICS

1 What is P.A.S.S.?

2 Bar Pass Success

3 Identifying Root Causes

4 Existing Initiatives

5 Immediately Achievable Actions

6 July 2024 Bar Exam Strategies

7 Pursuing top Students through Admissions

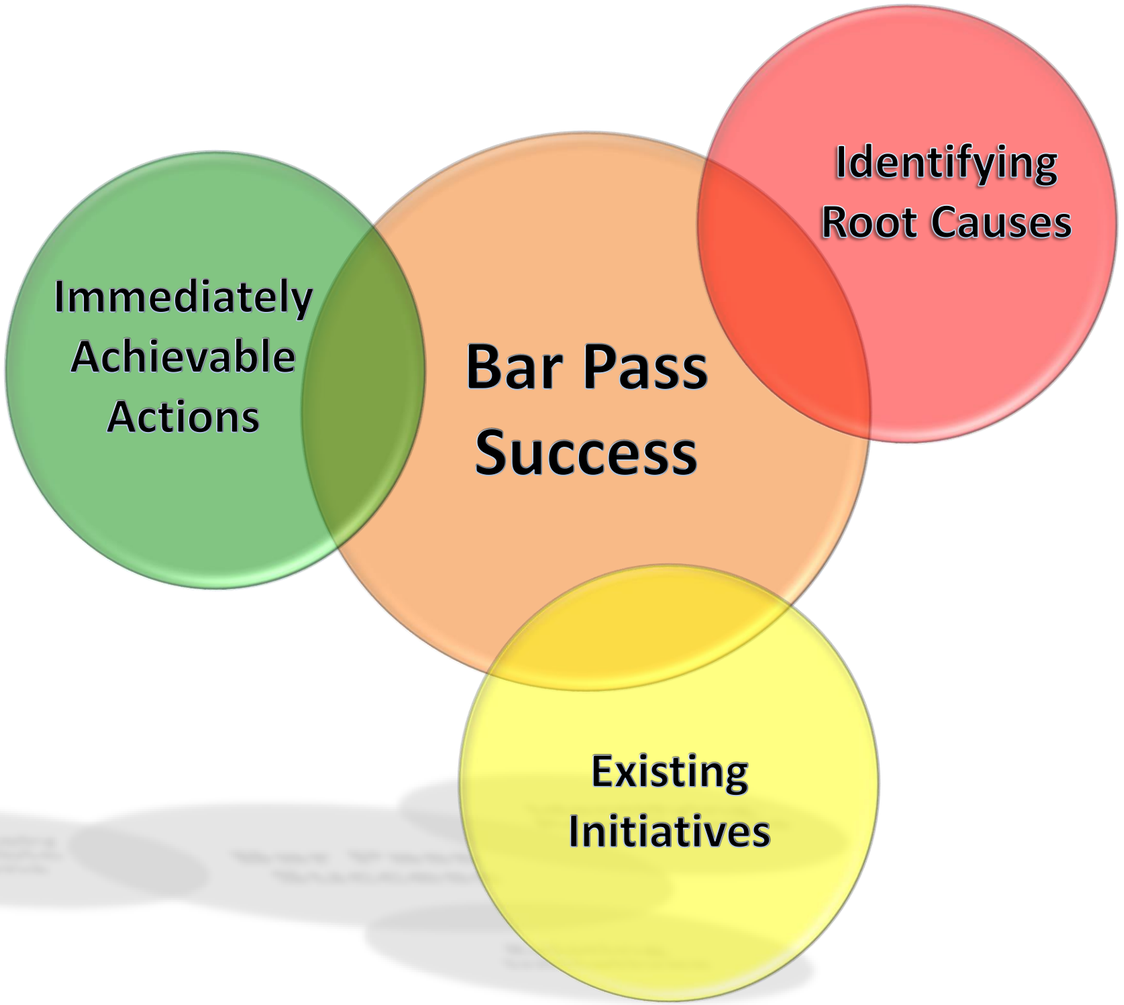
8 Future Focus Areas

# What is P.A.S.S.?

## Plan of Action for Sustained Success

- A comprehensive initiative to *identify, analyze, address and resolve* issues that have traditionally paralyzed the growth and sustainability of success at the FAMU College of Law
- Initially identified 20 specific areas of concern
- Grouped and targeted to five major focus points: Bar Pass Success, Admissions, Climate, Faculty and Staff Recruitment & Retention and Marketing and Communications
- **Priority Focus: Bar Pass Success**

# Priority Focus: Bar Pass Success



# Identifying Root Causes

***Student Centered***

- Low undergraduate academic profile (*Fla Comparables*)
- Lack of affordability for commercial bar
- Need for employment while preparing for exam
- Lack of confidence; support system
- Lack of time management skills
- Lack of discipline/class preparation

***Institution Centered***

- Understaffing of ASBP faculty and staff
- Lack of opportunity to reinforce skills – minimal formative assessments
- Lack of sufficient bar tested content
- Faculty pedagogy
- Directing resources to neediest students
- Lack of effective advising

# Existing Initiatives

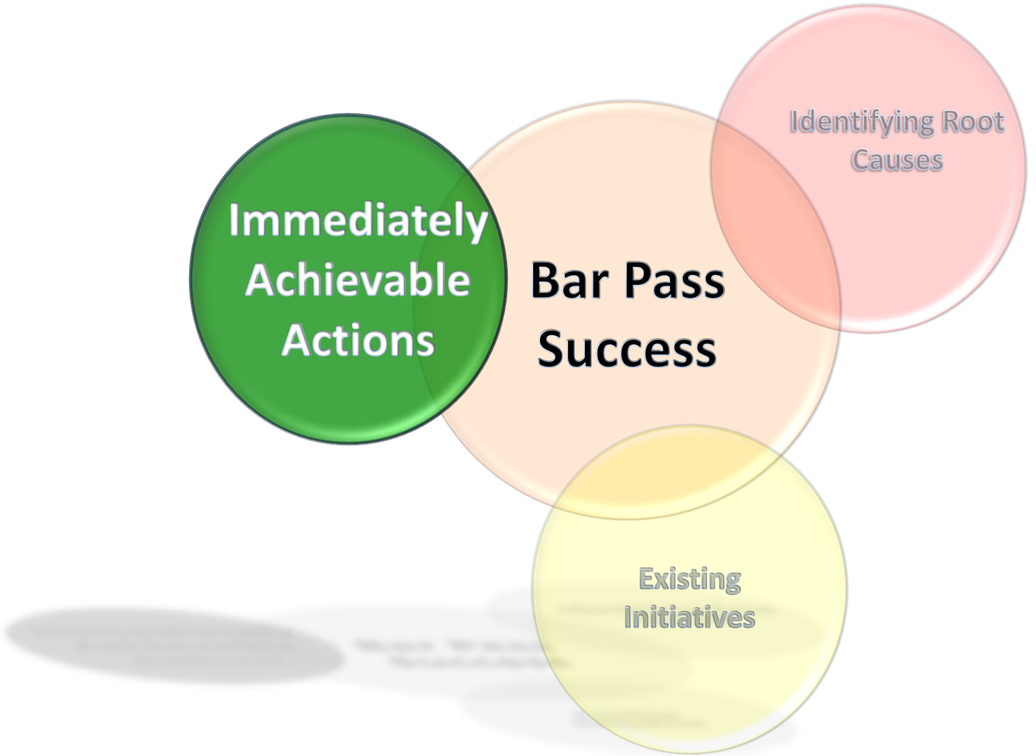
- Increased applicant academic profile (LSAT, GPA)
- Commercial Bar Prep 1L outlines and access to online practice questions
- Bar Prep Company Curriculums for Fla Bar Law Skills and Multistate Bar Law Skills courses.
- Intro to Analytical Skills I and II (IAS) courses
- IAS Skills Labs
- Advanced Analytical Skills (AAS) course
- Intense advising of vulnerable students
- R.I.S.E. Bar Support Program for February and July exams
- R.I.S.E. Teaching Assistant Program

# Immediately Achievable Actions

## Additional Personnel Resources

**HIRED!**

- Permanent Director of ASBP
- (2) Additional Full-Time ASBP Instructors
- (2) Replacement LRW Instructors
- Director of Writing Center
- Licensed Therapist
- Admissions Director
- Admissions Coordinator
- Registrar

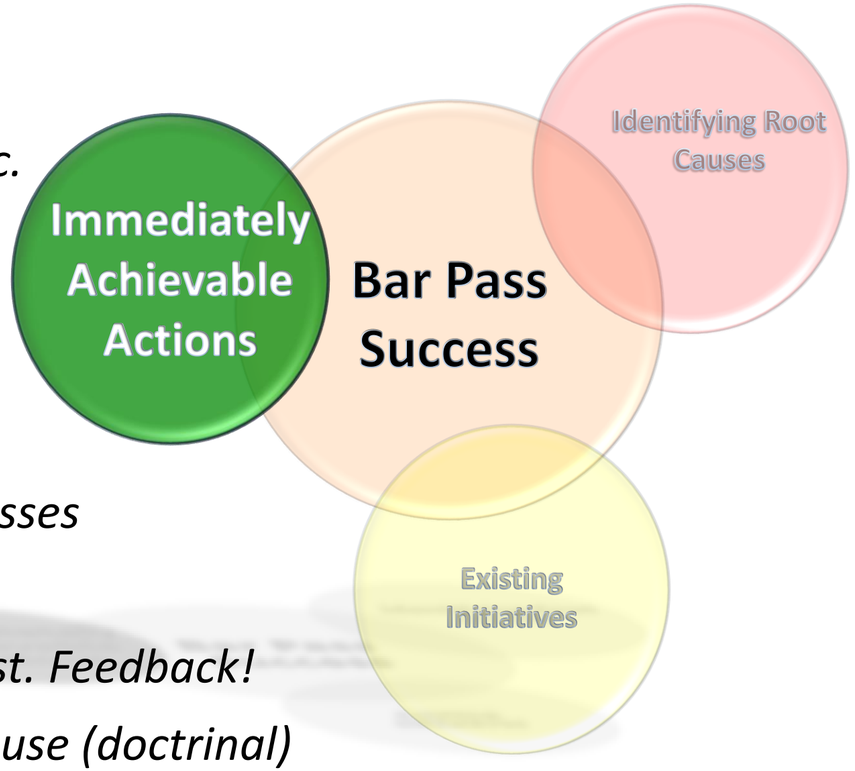


# Immediately Achievable Actions

## All Access Fully Immersive Bar Prep Package

**EVERY COL STUDENT**

- Lawyering Fundamentals – *pre-law asynchronous course*
- 1L, 2L, & 3L Mastery – *substantive law outlines, quizzes, videos, etc.*
- Targeted Intervention – *2L remedial curriculum*
- Extended Bar Review – *all seven MBE subjects*
- Post-Grad Bar Review Course – *10-week course*




- AdaptiBar – *MBE supplement, algorithm for strengths/weaknesses*
- MBE Advantage – *methods to attack MBE questions*
- Diagnostic Testing – *2L Diagnostic: 120 MCQ skill-focused test. Feedback!*
- Academic Access Platform – *5,000+ MCQ bank for faculty use (doctrinal)*
- Faculty Item Bank – *900 MBE-style multiple-choice questions*
- Bar Review Course Reporting – *review and evaluate student progress*

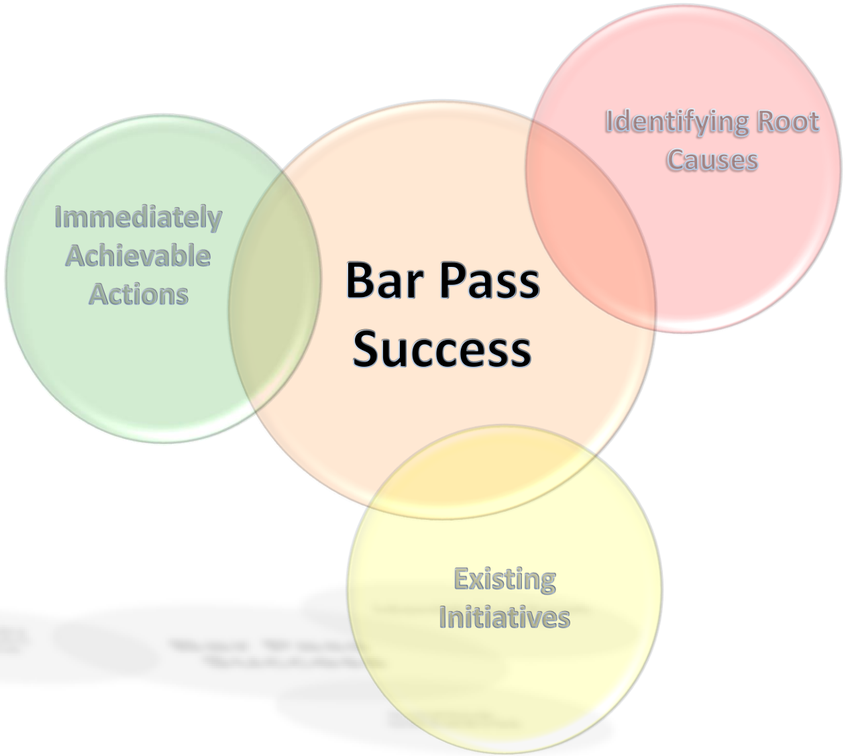


FAMU FLORIDA AGRICULTURAL AND MECHANICAL UNIVERSITY

# July 2024 Bar Exam Strategies

## Student Matters

- 87 Graduates
- All students are in a commercial bar course – *1/3 split*
- Early Bar Prep Conferencing – *starting NOW*
- Faculty sponsored substantive bar review sessions
- PMBR Simulated exam and on-campus luncheon
- On-Site Testing Support in Tampa – *both days of exam*



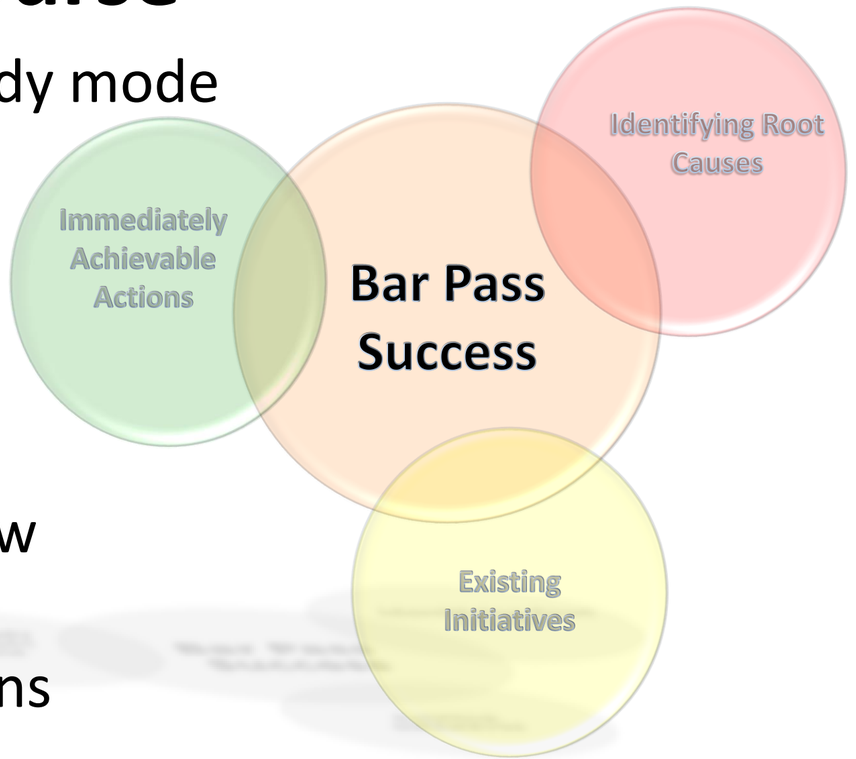

## Scholarships

- FAMU National Alumni Association – *$8,000*
- PLEDGE Fellowship Funds – *supplemental bar prep resources*

# July 2024 Bar Exam Strategies

## Kaplan/PMBR Course Combo: 7-Day Course

- Helps graduates build foundation to transition to bar study mode
- Includes 50 MCQs for each of the 7 MBE tested subjects
- Online Qbank of approximately 2,400 questions

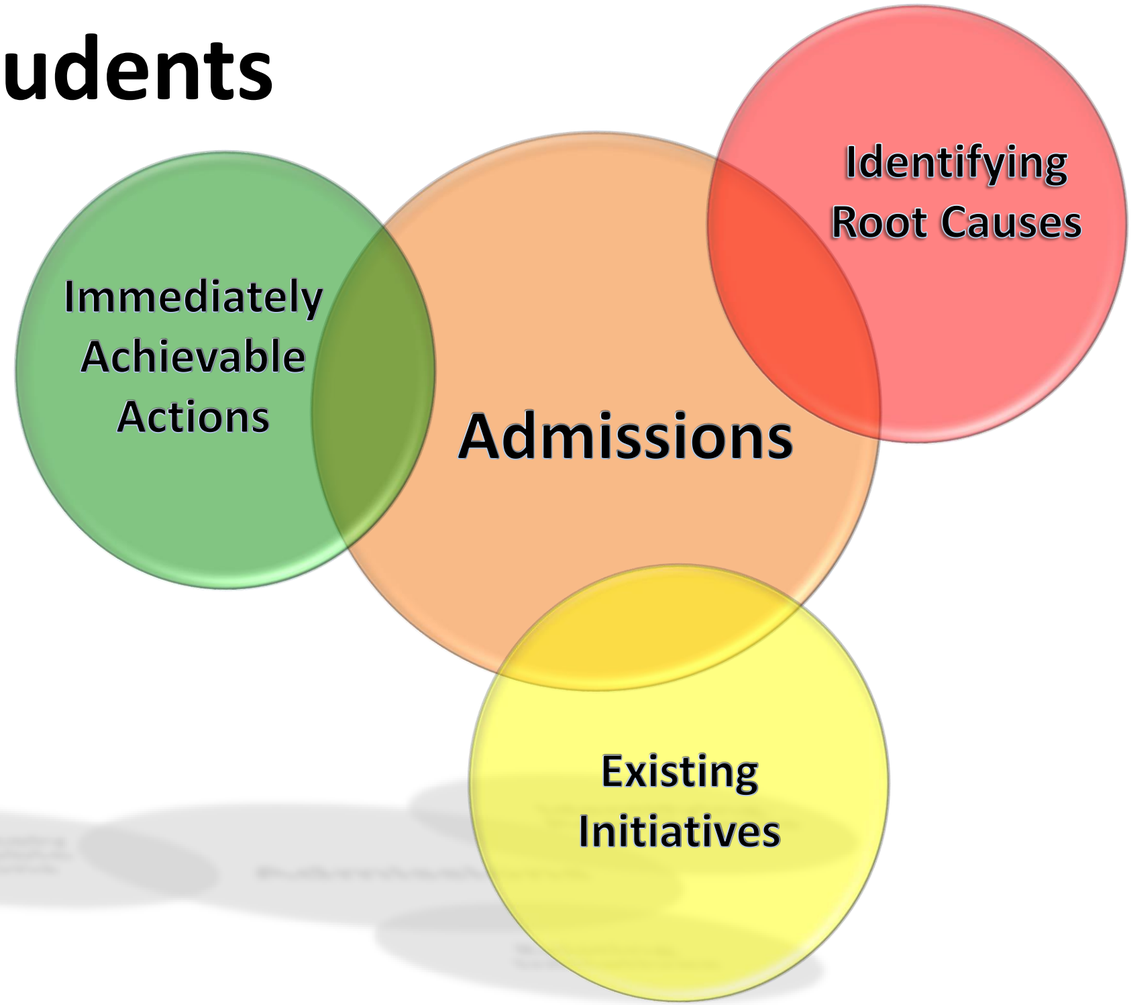



## 3-Day Course

- Highlights finer points of law not covered in bar review
- Full-day, 200-question simulated MBE
- (2) Consecutive days of LIVE review of all 200 questions
- AdaptiBar MBE Simulator with 1,900 questions

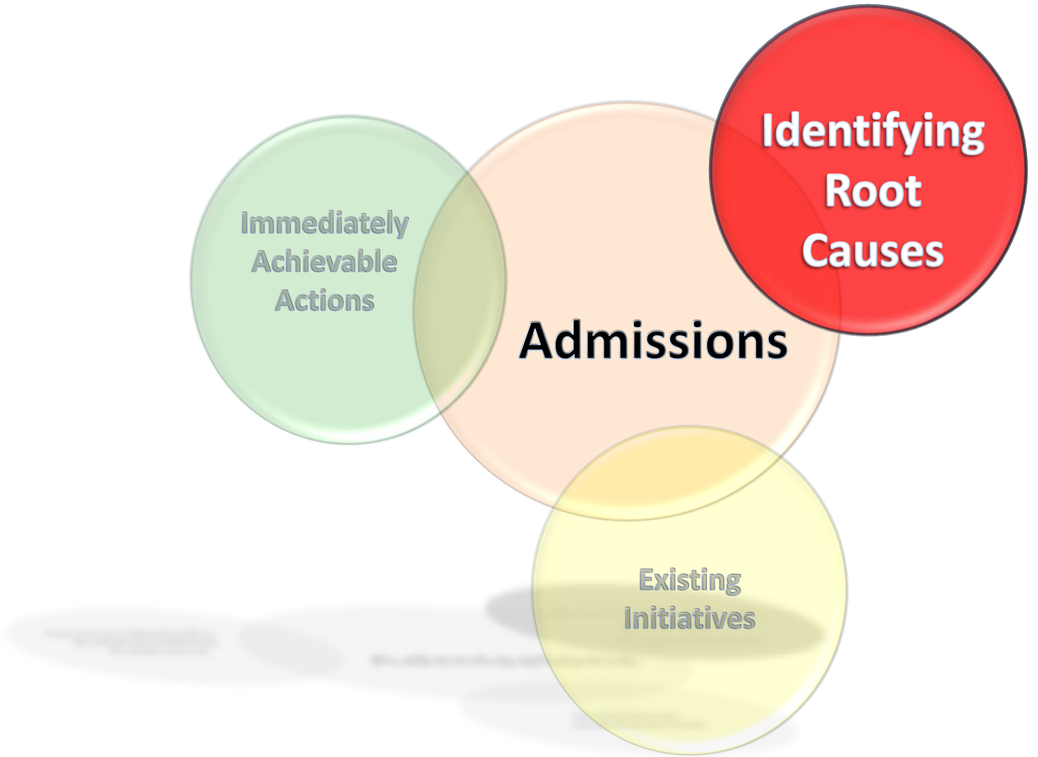
# Admissions

## Pursuing Top Students



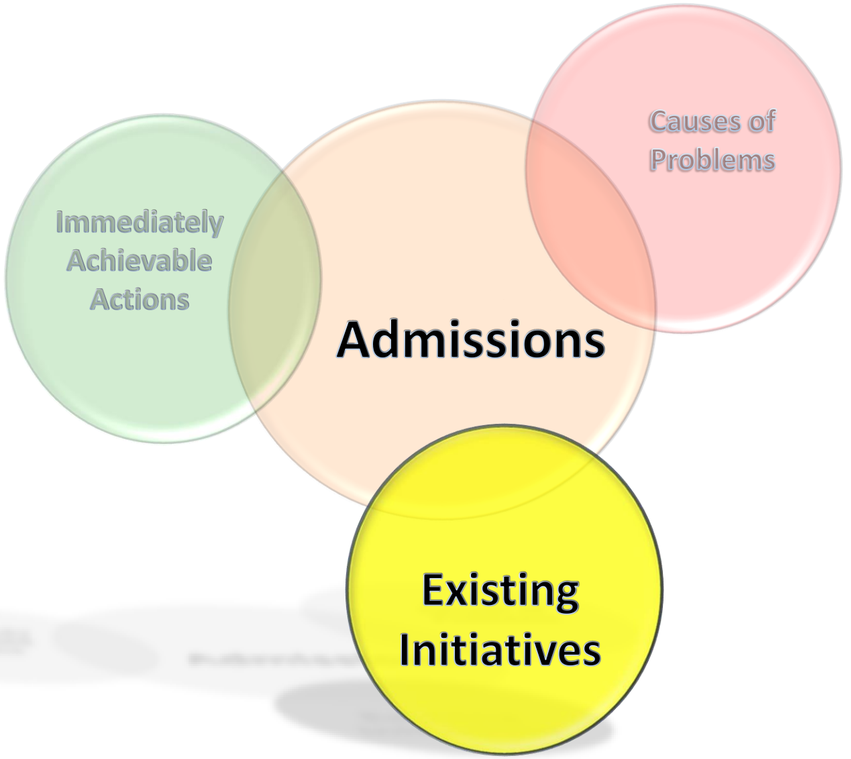
# Identifying Root Causes

- Less than 150 LSAT
- Less than 3.5 GPA
- Lack of Scholarship Dollars



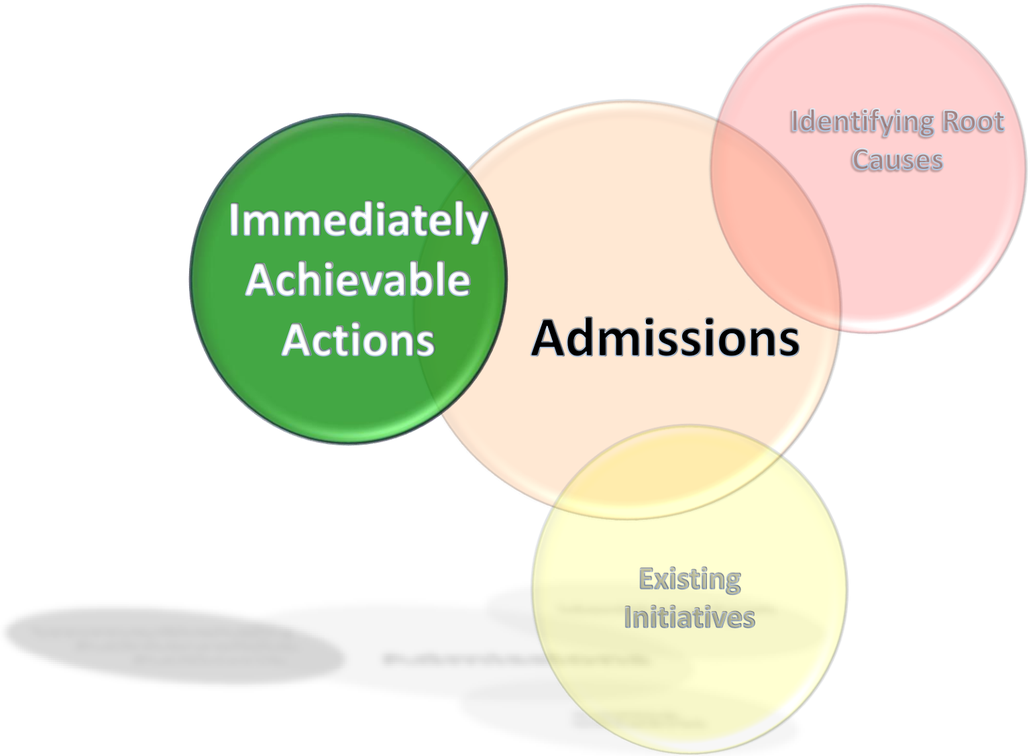
# Existing Initiatives

- Admit at 150 LSAT
- Admit at 3.5 GPA
- Academic Scholarships
- Retention Scholarships

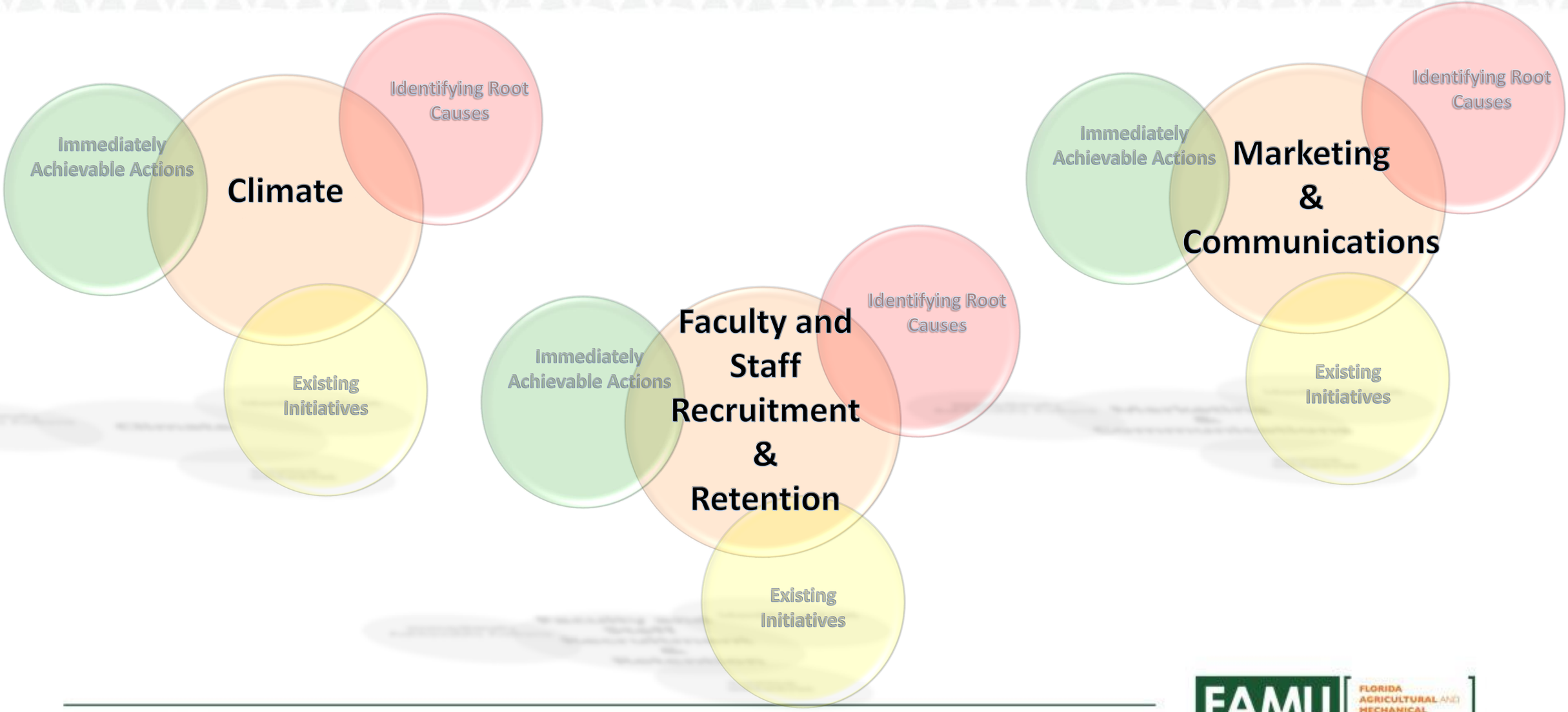


# Immediately Achievable Actions

- Admit 154 and above LSAT (Mean = 152)
- Admit 3.6 and above GPA
- Personal Phone Calls and Visits to Admits
- Admitted Students Dinners
- Attendance at Conferences
- Pipeline Efforts with small HBCUs
- Academic Scholarships
- Retention Scholarships



# Future Focus Areas



THANK YOU

# QUESTIONS?

FAMU | FLORIDA AGRICULTURAL AND MECHANICAL UNIVERSITY

May 2024

Florida A&M University

# COLLEGE OF LAW

FAMU

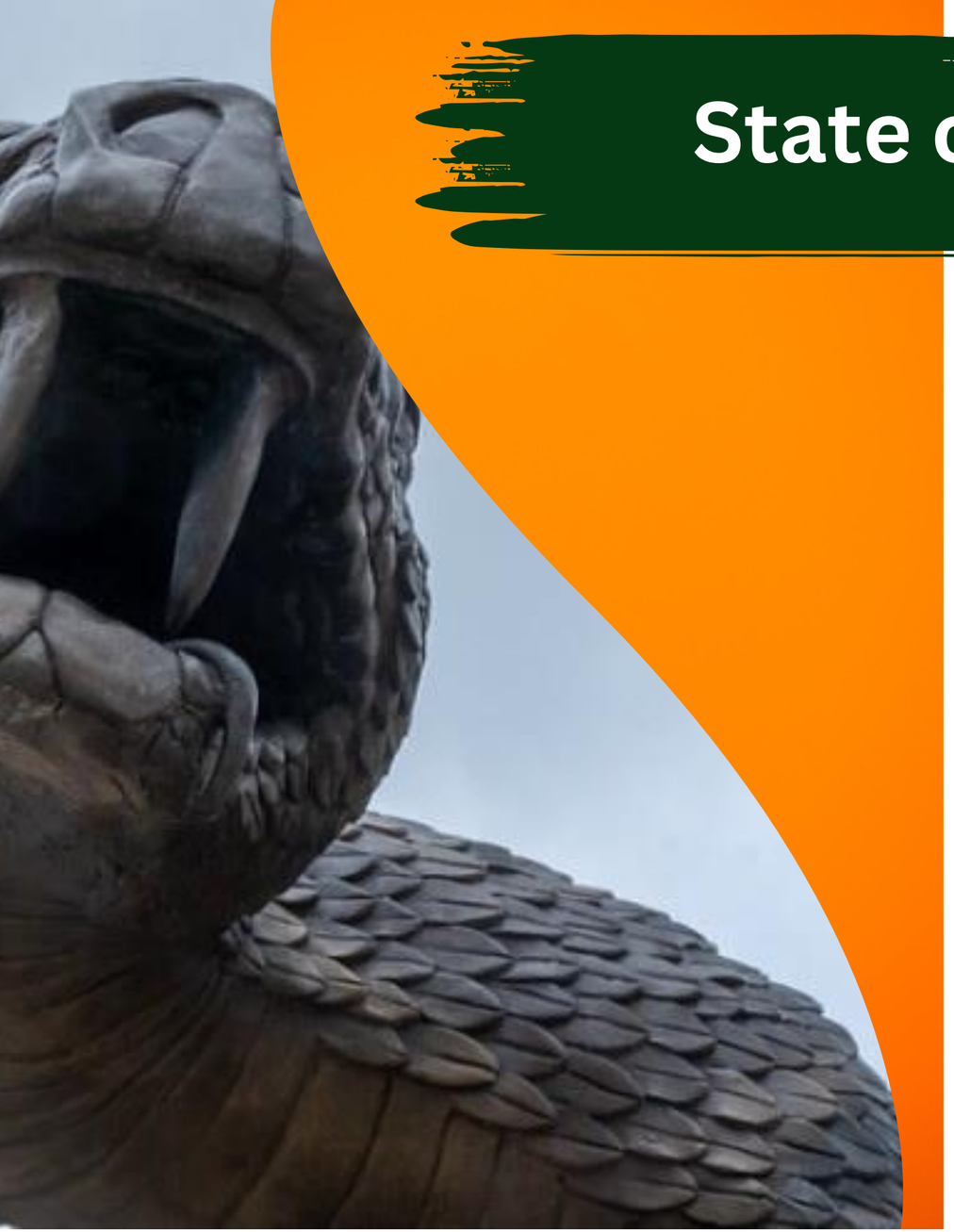
FLORIDA AGRICULTURAL AND MECHANICAL UNIVERSITY

# WEAREFAMUDRS

# State of the District

**Micheal Johnson**, Superintendent, FAMU DRS
**Dr. Sarah Price**, Dean, FAMU College of Education
**Dr. Patricia West**, Deputy Superintendent, FAMU DRS

FAMU FLORIDA A&M UNIVERSITY DEVELOPMENTAL RESEARCH SCHOOL



# State of the District

Reflecting and Looking Forward

Key Points of Pride

# Reflecting and Looking Forward

- FAMU DRS, through collaboration with Florida A&M University, the University of Central Florida, and Leon County Schools has been designated as an Enhancement Community School.

- FAMU DRS is expanding and enhancing the FAMU DRS School of Career Academies by adding the Embry Riddle Aeronautical Dual Enrollment Academy this year and plans to add a Health Academy next year, thereby increasing CAPE Industry Certification opportunities.

# Reflecting and Looking Forward

- FAMU DRS, along with Florida's three other state Lab Schools, has been awarded up to $500,000 in reoccurring funds to implement health education initiatives within each lab district. FAMU DRS' proposed Health Academy is planned to be a component of this initiative.

- FAMU DRS, through collaboration with the FAMU College of Education is proposing the construction of a model DRS Multi-Purpose STEM Education Building. The multi-purpose STEM building will house STEM, CTE and Health Education programs.

# Key Points of Pride

- FAMU DRS has maintained a **95%** graduation rate for two consecutive years and is consistently performs above the state average in this area.
- FAMU DRS has significantly increased enrollment in Career and Technical Education (CTE) courses through the development of the Embry Riddle Aeronautical University Dual Enrollment Academy and the FAMU DRS Middle School Acceleration Academy.
- **Approximately 40** high school scholars are currently participating in the FAMU DRS Dual Enrollment Program. This comprises **32%** of students enrolled in grades 10-12 at FAMU DRS.

# Key Points of Pride

- Based upon the FAMU DRS Future Center Decision Day Event, **100%** of our graduating seniors are college or career ready and intend to attend a post-secondary education at a four-year college college or university, community college, technical school, or a branch of the military; and **15** (47%) seniors have been accepted to Florida Agricultural & Mechanical University (FAMU).


# Key Points of Pride

Student Learning Gains

- Reading student learning gains have improved by 59%
- Math student learning gains have improved by 56%
- 4th grade Math assessment scores are at 78%

Middle School Acceleration Gains

- Middle School scholars have earned 84% in acceleration points

Dual Enrollment

- Over 40 students are participating in our dual enrollment program this year
- 100% of 2024 graduating seniors are college and career ready
- 15 out of 35 graduating seniors have been accepted to FAMU

# FAMU DRS Leadership

Dean
Florida A&M University
College of Education

Superintendent
Florida A&M University
Developmental Research School

Deputy Superintendent
Florida A&M University
Developmental Research School

WEAREFAMUDRS

# Thank You

FAMU FLORIDA A&M UNIVERSITY DEVELOPMENTAL RESEARCH SCHOOL