Ohio | Board of Regents
University System of Ohio

John R. Kasich, Governor
John Carey, Chancellor

Request for Approval

Submitted by
Kent State University

# Establishment of a Bachelor of Science Degree in Aeronautical Systems Engineering Technology

*Date to come*
*(after Board of Trustees approval)*

KENT STATE UNIVERSITY

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## REQUEST

**Date of submission:** *date to come (after Board of Trustees approval)*

**Name of institution:** Kent State University

**Degree/degree program title:** Aeronautical Systems Engineering Technology major within Bachelor of Science degree

**Primary institutional contact for the request**

Name: Therese E. Tillett
Title: Executive Director, Curriculum Services
Office of the Provost
Phone: 330-672-8558
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**Delivery site(s):** Kent Campus

**Date that the request was approved by the institution's governing board:**
*Date to come*

**Proposed start date:** Fall 2017

**Date Institution established:** 1910

**Institution's programs:** Degree programs at the associate, bachelor's, master's, post-master's, doctoral levels; undergraduate and graduate certificates (total 326 majors in 44 degrees and 67 certificates as of fall 2015)

**Educator Preparation Programs:**

| | |
|---|---|
| Program leads to licensure | No |
| Program leads to endorsement | No |

## SECTION 1: INTRODUCTION

### 1.1 Brief summary of the request

Kent State University proposes to establish a Bachelor of Science degree in Aeronautical Systems Engineering Technology. The program has existed as a concentration within the Aeronautics major since 1989.

The program's establishment is in response to a citation from the Engineering Technology Accreditation Commission (ETAC) of ABET. The commission found that the curriculum for the Aeronautics major does not strongly align with the needs of the Aeronautical Systems Engineering Technology program, which requires an in-depth focus on technical engineering concepts to develop student competency in the use of equipment and engineering tools and to prepare graduates for increasingly complex technical specialties in the industry.

Establishing a separate degree program will eliminate the need to maintain the current core of aeronautics courses and allow the program to better serve its graduates and the aeronautics industry by creating educational depth in the areas of engineering materials, electro-mechanical devices and control, and systems engineering.

The base infrastructure for the proposed Aeronautical Systems Engineering Technology major is already in place through the existing Aeronautics concentration. The Aeronautical Systems Engineering Technology major will require no new courses but will be modified to take advantage of existing courses offered by the aeronautics and technology programs (such as statics, programmable logic controllers and mechatronics).

## SECTION 2: ACCREDITATION

### 2.1 Regional accreditation

| | |
|---|---|
| Original date of accreditation: | 1915 |
| Date of last review: | 2007 - 2008 |
| Date of next review: | 2014 - 2015 |

### 2.2 Results of the last accreditation review

Kent State University's accreditation was reaffirmed by the Higher Learning Commission on 26-27 January 2015[1].

### 2.3 Notification of appropriate agencies

***Provide a statement indicating that the appropriate agencies (e.g., regional accreditors, specialized accreditors, state agencies) have been notified of the institution's request for authorization of the new program. Provide documentation of notification as appendix item.***

Notification to the Higher Learning Commission will occur after the Ohio Department of Higher Education has approved the program. Kent State has already sought accreditation of its Aeronautical Systems Engineering Technology concentration by ETAC of ABET; the team visit occurred in October 2015. It is because of ABET's recent visit and findings that this request is being made.

## SECTION 3: LEADERSHIP—INSTITUTION

### 3.1 Mission statement

We transform lives and communities through the power of discovery, learning and creative expression in an inclusive environment. (www.kent.edu/kent/mission)

### 3.2 Organizational structure

The Kent State administrative structure can be found at www.kent.edu/administration.

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[1] Correspondence from HLC President Barbara Gellman-Danley (4 February 2015). Retrieved from http://hlcommission.org/download/_ActionLetters/Kent%20State%20University%20AQIP%20Reaffirmation%20Action%20Letter%201-27-15.pdf.

## SECTION 4: ACADEMIC LEADERSHIP—PROGRAM

### 4.1 Organizational structure

***Describe the organizational structure of the proposed program. In your response, indicate the unit that the program will be housed within and how that unit fits within the context of the overall institutional structure. Further, describe the reporting hierarchy of the administration, faculty, and staff for the proposed program.***

Kent State's College of Applied Engineering, Sustainability and Technology functions as one organizational unit with three separate and distinct program areas (aeronautics, applied engineering and construction management); each program area is led by either a program director or a coordinator. The proposed Aeronautical Systems Engineering Technology degree program will reside in the aeronautics program area under the leadership of the aeronautics senior program director. See Appendix A for an organizational chart of this program area within the college.

***Provide the title of the lead administrator for the proposed program and a brief description of the individual's duties and responsibilities. Describe the qualifications of this individual for the oversight of a distance education program. Include this individual's CV/resume as an appendix item.***

The lead administrator is Senior Academic Program Director Maureen McFarland. Characteristic duties and responsibilities include, but are not limited to, directing the administrative, instructional, operational and technological aspects of the aeronautics program; establishing and/or revising components of the aeronautics program; managing the aeronautics program budget; advising and counseling students and/or program clients; creating, implementing and overseeing the academic schedule; working with faculty in the assignment of academic load; hiring of part-time faculty; and coordinating marketing activities for assigned program. See Appendix B for Ms. McFarland's curriculum vitae.

***Describe any councils, committees or other organizations that support the development and maintenance of the proposed program. In your response, describe the individuals (by position) that comprise these entities, the terms of their appointment, and the frequency of their meetings.***

Two committees—the Aeronautics Advisory Board and the College Industry Advisory Board—have supported the movement of the aeronautical systems engineering program from a concentration under aeronautics to a separate Bachelor of Science degree. Members of both have two-year appointments and hold meetings twice a year.

**Aeronautics Advisory Board**

| Name | Title/Company |
|---|---|
| Donald Cassaniti | Special Projects Manager, Cleveland Air Traffic Control Tower/TRACON, FAA |
| Clark Earick | General Manager and Vice President, Corporate Strategy, Delta Private Jets |
| Michael Heil | President and Chief Executive Officer, Ohio Aerospace Institute |
| Linell Homentosky | Airport Planner, AECOM |
| Dan Sarachene | Captain, Delta Airlines |
| Mark Zuranski | Chief Pilot, Eaton Corporation |
| Donata Ziedins | Manager of Human Factors, United Airlines |

**College Industry Advisory Board**

| Name | Title/Company |
|---|---|
| Chris Bauer, Capt | President and Chief Executive Officer, Hughes Aerospace Corp. |
| Robert Bianco | Chief Engineer, United Technologies Aerospace Systems |
| Mark L. Cironi | President, Green Energy Technologies |
| Christine C. Dodd | Director of Public Affairs, IceMiller |
| David DuBois | Principal, The Social Design Group |
| Charles Ducey | Executive Vice President (retired), Diebold |
| Steve Eisenbrown | Rockwell Automation (retired) |
| David J. Enzerra | President, The Lubrizol Foundation |
| Rachel Heidenreich | Vice President, Engineering Services, Rockwell Automation |
| David Mayewski | Business Development Leader, Rockwell Automation |
| Dennis McGavis | Director, Global Environment Health and Safety, Goodyear |
| Frank Natoli | Executive Vice President and Chief Innovation Officer, Diebold |
| Roger Quinn | System Chief Pilot, UPS Airlines |
| Anthony Rohloff | Founding Partner, Premier Flight Academy, Ltd |
| Dan Sarachene | Captain, Delta Airlines |
| Joe Shaw | NASA, retired |
| Fred S. Szabo | Commissioner, Cleveland International Airport |
| David Woodyard | Manager, Global Sustainability, Goodyear |
| Sharon Van Zeeland | Vice President, Business Development, Fairmount Minerals |

## 4.2 Program development

***Describe how the proposed program aligns with the institution's mission.***

Approval of this request will permit Kent State University to model its core values of providing active inquiry and discovery that expands knowledge and human understanding while providing a distinctive blend of teaching research and creative excellence.

***Indicate whether the institution performed a needs assessment/market analysis to determine a need for the program. If so, briefly describe the results of those findings. If completed, submit the full analysis as an appendix item.***

Technology trends in aerospace engineering are shifting toward increasing the sustainability, safety and reliability of current airframes while minimizing their environmental impact. The proliferation of unmanned aerial systems (UAS) over the past decade has affected the aerospace industry in a way never before anticipated or imagined. As part of the 2012 FAA Reauthorization Act, UAS will be integrated into the National Airspace System. Although government dominance has declined in recent years, the rise of the commercial space and UAS industries is expected to translate to a growth rate of 4,000 new jobs in the U.S. between 2010 and 2020.

The emergence of the UAS industry contributes to the greater demand for additional aeronautical systems engineering technology graduates within the state. Ohio recently partnered with Indiana to designate an UAS Test Center near Dayton, with the hopes of becoming one of the FAA's UAS Test Centers. Kent State University will poised to play a significant role in these aerospace milestones with an improved aeronautical systems engineering technology curriculum, in addition to its already established and recognized programs in air traffic control, flight technology and unmanned aircraft systems.

There are no public or private universities in Ohio offering an ABET-accredited aeronautical systems engineering technology program. There are only two similar programs nationwide, the closest being at Purdue University in Indiana.[2]

***Indicate whether the institution consulted with advisory groups, business and industry, or other experts in the development of the proposed program. If so, briefly describe the involvement of these groups in the development of the program.***

The opportunities for collaboration in this technology and manufacturing corridor of the state are significant. The Federal Government maintains a strong aerospace presence in Cleveland with the NASA Glenn Research Center. Numerous large industries such as Parker Aerospace, Timkin, Eaton and Materion are headquartered in Northeast Ohio.

Kent State University already has an established relationship with many of these organizations and secured internships for several of its students. Implementing the modified and more robust aeronautical systems engineering technology curriculum at Kent State will allow the region to capitalize on and strengthen these existing relationships, enhancing their own ties to the region by developing and mentoring competent engineers, a majority of whom come from Northeast Ohio.

***Indicate whether the proposed program was developed to align with the standards of a specialized or programmatic accreditation agency. If so, indicate whether the institution plans to pursue programmatic/specialized accreditation for the proposed program and provide a timeline for achieving such accreditation. If the program is already accredited, indicate the date that accreditation was achieved and provide information on the next required review.***

This request is being made as a direct result of feedback given by ABET as a result of a site visit in October 2015. From the ABET draft report, "The present curriculum…lacks a focus on technical engineering concepts. As a result, engineering topics are not covered in depth…The program must ensure that its curriculum has a technical core that develops student competency in the use of equipment and engineering tools appropriate to the discipline." To meet the standards of ABET, the program's curriculum needed to be revised, which affected greatly affected the Aeronautic major core. To remain compliant with the Ohio Department of Higher Education's definition of a concentration, the aeronautical systems engineering technology program needed to be changed from a concentration under aeronautics to its own bachelor's degree program.

### 4.3 Collaboration with other Ohio institutions

***Indicate whether any USO institutions within a 30-mile radius of your institution offer the proposed program. If so, list the institutions that offer the proposed program and provide a rationale for offering an additional program at this site.***

At present, there are no Ohio public institutions in Northeast Ohio offering a bachelor's degree in aeronautical systems engineering technology. There are only two other ABET-accredited aeronautical systems engineering technology programs nationwide.

[2] Find an ABET-Accredited Program. Retrieved from main.abet.org/aps/accreditedprogramsearch.aspx

***Indicate whether the proposed program was developed in collaboration with another institution in Ohio. If so, briefly describe the involvement of each institution in the development of this request and the delivery of the program.***

No additional collaboration was sought in the refinement of the existing concentration in aeronautical systems engineering technology.

## SECTION 5: STUDENT SERVICES

### 5.1 Admissions policies and procedures

***Describe the admissions requirements for the program. In your response, highlight any differences between the admission requirements for the program and for the institution as a whole.***

The admission criteria for the Aeronautical Systems Engineering Technology major will remain unchanged, adhering to general admission for freshman students at the Kent Campus. The freshman admission policy at the Kent Campus is selective. Admission decisions are based upon the following: cumulative grade point average, ACT and/or SAT scores, strength of high school college preparatory curriculum and grade trends. The university affirmatively strives to provide educational opportunities and access to students with varied backgrounds, those with special talents and adult students who graduated from high school three or more years ago. For more information on admissions, visit the Admissions website for new freshmen.

Transfer student who wish to declare the Aeronautical Systems Engineering Technology major will be required to hold a minimum 2.25 overall GPA in all college-level coursework.

***Describe the transfer credit policies for the proposed program, including the use of credit transfer review committees and the maximum number of hours that can be transferred into the program. In your response, specifically address the credit that may be transferred according to the Board of Regents' Transfer Assurance Guide (TAG) and Career Technical Credit Transfer ($CT^2$) initiatives; and other types of transfer credit awarded toward major program requirements (e.g., AP, life experience, CLEP, portfolio).***

Kent State's Transfer Center reviews and applies transfer coursework where appropriate as determined by state policies and faculty review. Kent State's residence policy requires that transfer students complete a minimum 30 semester hours (including 9 semester hours of upper-division coursework in the major) at Kent State to be awarded a bachelor's degree.

The majority of courses in the Kent Core (general education requirements) are approved as Ohio Transfer Module courses. Credit earned through military service, Advanced Placement (AP), International Baccalaureate (IB), College Level Examination Program (CLEP) and Kent State's Credit-by-Exam, among others, is awarded for general education requirements and electives.

### 5.2 Student administrative services

***Indicate whether the student administrative services (e.g., admissions, financial aid, registrar) currently available at the institution are adequate to support the program. If new or expanded services will be needed, describe the need and provide a timeline for acquiring/implementing such services.***

The student administrative services currently available at Kent State University are adequate to support the proposed Aeronautical Systems Engineering major; no new services are necessary.

### 5.3 Student academic services

***Indicate whether the student academic services (e.g., career services, counseling, tutoring, ADA) currently available at the institution are adequate to support the program. If new or expanded services will be needed, describe the need and provide a timeline for acquiring/implementing such services.***

Student academic services currently available at Kent State University are adequate to support the proposed Aeronautical Systems Engineering major.

## SECTION 6: CURRICULUM

### 6.1 Introduction

***Provide a brief description of the proposed program as it would appear in the catalog.***

The Bachelor of Science degree in Aeronautical Systems Engineering Technology focuses on the application of engineering principles to the design, manufacturing and functionality of aerospace vehicles such as aircraft and spacecraft, to include autonomous and semi-autonomous unmanned aerial systems. Students will gain an in-depth knowledge of aerodynamics, aerospace materials, structures, propulsion, flight mechanics and stability and control while being briefly exposed to orbital mechanics, control, space structures and rocket propulsion.

See Appendix D for the program's entry in the University Catalog.

### 6.2 Program goals and objectives

***Describe the goals and objectives of the proposed program. In your response, indicate how these are operationalized in the curriculum.***

The goal of Aeronautical Systems Engineering Technology major is to produce engineers who

- possess a deep understanding of the technical fundamentals in aeronautical systems engineering technology;
- excel in the research, development, innovation and operation of aerospace products and systems; and
- understand the importance of engineering and the responsibility of engineers to society.

Graduates of the BS degree in Aerospace Systems Engineering Technology major will have the ability to accomplish the following:

- Select and apply the knowledge, techniques, skills and modern tools of the discipline to broadly-defined engineering technology activities.
- Select and apply a knowledge of mathematics, science, engineering and technology to engineering technology problems that require the application of principles and applied procedures or methodologies.
- Conduct standard tests and measurements; conduct, analyze and interpret experiments; apply experimental results to improve processes.
- Design systems, components or processes for broadly defined engineering technology problems appropriate to program educational objectives.
- Function effectively as a member or leader on a technical team.
- Identify, analyze and solve broadly defined engineering technology problems.
- Apply written, oral and graphical communication in both technical and non-technical environments; identify and use appropriate technical literature.
- Understand the need for and engage in self-directed continuing professional development.
- Recognize and commit to professional and ethical responsibilities, including respect for diversity.
- Understand the impact of engineering technology solutions in a societal and global context.
- Commit to quality, timeliness and continuous improvement.

### 6.3 Course offerings and descriptions

| Course (number/name) | Cr hrs | Major Core | Gen Ed (Kent Core) | Elective | OTM TAG CTAG | New/ Existing Course |
|---|---|---|---|---|---|---|
| **MAJOR REQUIREMENTS (69 credits)** | | | | | | |
| AERN 15300 Intro to Engineering Analysis Using Matlab | 3 | ■ | | | | Existing |
| AERN 15500 Introduction to Aerospace Engineering | 3 | ■ | | | | Existing |
| AERN 20000 Professional Development in Aeronautics I | 1 | ■ | | | | Existing |
| AERN 25200 Statics | 2 | ■ | | | | Existing |
| AERN 30000 Professional Development in Aeronautics II | 1 | ■ | | | | Existing |
| AERN 35040 Aircraft Systems I | 3 | ■ | | | | Existing |
| AERN 35150 Aircraft Structures | 3 | ■ | | | | Existing |
| AERN 45030 Aircraft Systems II | 3 | ■ | | | | Existing |
| AERN 45121 Aerospace Propulsion for Engineering | 3 | ■ | | | | Existing |
| AERN 45150 Applied Flight Dynamics I | 3 | ■ | | | | Existing |
| AERN 45151 Applied Flight Dynamics II | 3 | ■ | | | | Existing |
| AERN 45291 Aerospace Senior Seminar | 1 | ■ | | | | Existing |
| AERN 45700 Aircraft Design | 3 | ■ | | | | Existing |
| AERN 45850 Aircraft Design II | 3 | ■ | | | | Existing |
| AERN Electives | 6 | ■ | | | | Existing |
| TECH 13580 Engineering Graphics I | 3 | ■ | | | | Existing |
| TECH 20002 Materials and Processes I | 3 | ■ | | | | Existing |
| TECH 21021 Survey of Electricity and Electronics | 4 | ■ | | | | Existing |
| TECH 33031 Programmable Logic Controllers | 3 | ■ | | | | Existing |
| TECH 33111 Strengths of Materials | 3 | ■ | | | | Existing |
| TECH 33032 Programmable Logic Controllers II | 3 | ■ | | | | Existing |
| TECH 33040 Motors and Controllers | 3 | ■ | | | | Existing |
| TECH 43030 Mechatronics | 3 | ■ | | | | Existing |
| TECH 47200 Systems Engineering | 3 | ■ | | | | Existing |

| Course (number/name) | Cr hrs | Major Core | Gen Ed (Kent Core) | Elective | OTM TAG CTAG | New/ Existing Course |
|---|---|---|---|---|---|---|
| **KENT CORE (GENERAL EDUCATION) / ADDITIONAL REQUIREMENTS (52 credits)** | | | | | | |
| COMM 15000 Introduction to Human Communication | 3 | | ■ | | OTM | Existing |
| ECON 22060 Principles of Microeconomics | 3 | | ■ | | TAG | Existing |
| MATH 12002 Analytic Geometry and Calculus I | 5 | | ■ | | OTM | Existing |
| MATH 12003 Analytic Geometry and Calculus II | 5 | | ■ | | TAG | Existing |
| MATH 22005 Analytic Geometry and Calculus III | 4 | | ■ | | TAG | Existing |
| PHY 23101 General University Physics I | 5 | | ■ | | TAG | Existing |
| PHY 23102 General University Physics II | 5 | | ■ | | TAG | Existing |
| UC 10097 Destination Kent State: First Year Experience | 1 | | ■ | | | Existing |
| Kent Core Composition | 6 | | ■ | | OTM | Existing |
| Kent Core Humanities and Fine Arts | 9 | | ■ | | OTM | Existing |
| Kent Core Social Sciences | 3 | | ■ | | OTM | Existing |
| Kent Core Additional | 3 | | ■ | | OTM | Existing |

## Major Core Course Descriptions (syllabi provided in Appendix E)

**AERN 15300 Matlab for Aerospace Engineers.** Introduction to the Matlab computing language, the industry-standard "first language" for engineers. Algorithm coding and development, debugging, analysis, and interpretation.

**AERN 15500 Introduction to Aerospace Engineering.** Introduction to the field of aerospace engineering beginning with a historical perspective followed by an introduction to the fundamentals of fluid mechanics, applied aerodynamics, propulsion systems, airplane performance, stability, orbital motion, and launch vehicle performance.

**AERN 20000 Professional Development in Aeronautics I**. The course will provide an overview of the current state of the aeronautics industry while preparing students for various internship and scholarship opportunities. Students will begin preparation for a career in the aeronautics industry by establishing a professional foundation in the areas of career planning and goal setting.

**AERN 25200 Statics.** Forces and moments; equilibrium in two and three dimensions; multi-force members; equilibrium, centroids and friction.

**AERN 30000 Professional Development in Aeronautics II**. The course will build upon the lessons learned in Professional Development in Aeronautics I by providing direct opportunities for interviewing and networking with professionals working in the aeronautics industry. Students will continue preparation for a career in the aeronautics industry by revising and implementing their career plan and goals.

**AERN 35020 Aircraft Systems I**. A study of basic reciprocating and gas turbine engine theory. Course investigates powerplant construction, component function, including propeller and fuel systems, ancillary systems that support aircraft propulsive systems and performance characteristics.

**AERN 35150 Aircraft Structures.** Aircraft structural design investigations dealing with theory and applications in aviation.

**AERN 45030 Aircraft Systems II**. Continuation of AERN 35040. An in-depth study of various aircraft systems including auxiliary systems, undercarriage, hydraulics, flight controls, instruments, and integrated systems as applied to aircraft.

**AERN 45121 Advanced Aerospace Propulsion.** A thorough study of propulsion systems used in the aeronautics industry beginning with an introduction to the reciprocating engine and ending with the study of modern rocketry. Emphasis is given to advanced systems such as gas turbine engines and hypersonic propulsion systems.

**AERN 45150 Applied Flight Dynamics I**. An applied aircraft flight dynamics course that demonstrates aircraft, engine and propeller performance with the overall flight performance and stability of the typical subsonic airplane. Emphasis is placed on the aerodynamics of flight.

**AERN 45151 Applied Flight Dynamics II**. Aerodynamics, flight dynamics, and flight performance of high performance aircraft. Course includes supersonic aerodynamics, flight stability and handling, and an in-depth investigation and analysis of flight performance parameters including lift, drag, load factor, climb performance, and turn performance.

**AERN 45291 Aerospace Senior Seminar.** Seminar on selected topics relating to problems, issues and conditions of employment within aviation.

**AERN 45700 Aircraft Design.** Preliminary design of a fixed-wing aircraft for a specific mission: weight estimates; wing planform, airfoil and propulsion; selection airframe configuration and layout design; performance analysis; and overall systems integration.

**AERN 45850 Aircraft Design II.** Second of a two-course series of aerospace design. Preliminary design or case study of an aerospace vehicle, including but not limited to aircraft, rotorcraft, and spacecraft. Primary focus on sub-system design (i.e., propulsion, structure, controls, etc.), and overall vehicle integration of these subsystems. Cost analysis and safety analysis. Final technical report and/or model prototype.

**TECH 13580 Engineering Graphics I.** Technique of engineering drawing, lettering, instrument use, freehand drawing, orthogonal projection, sections, single and double auxiliaries, dimensioning, screw threads, charts and graphs.

**TECH 20002 Materials and Processes I**. Study and practice addressing the nature of basic manufacturing materials and the processes by which they are converted into manufactured products. Includes laboratory experience.

**TECH 21021 Survey of Electricity and Electronics**. Survey of DC and AC circuits, semiconductors, and electronic devices, including diodes and transistors. Includes laboratory.

**TECH 33031 Programmable Logic Controllers**. An introduction to programmable logic controllers (PLCS) covering hardware, ladder logic programming, networking and communications. Programming timers, counters and sequencers and an introduction to human machine interfaces (HMIS).

**TECH 33032 Programmable Logic Controllers II**. Advanced principles and applications of programmable logic controllers with a focus on using sequential function charts to control complex industrial processes. Includes real time control issues, PLC networking, programming languages other than ladder logic, standards, motion control, supervisory control and data acquisition, process control, alarm management, power failure strategies and safety.

**TECH 33111 Strengths of Materials.** An analytical study of the relaxation between the external forces applied to elastic materials and the resulting deformations and stresses.

**TECH 33040 Motors and Controllers**. AC and DC motors, motor control, and machine operations in mechatronic systems. Includes introduction to basic control system terms and devices, input and output transducers, signal conditioning, open loop and closed loop control, stability and performance.

**TECH 43030 Mechatronics**. Application of automation concepts in motion control, electrical circuits, fundamental mechanics, control systems and programming including modeling, interfacing and signal conditioning.

**TECH 47200 Systems Engineering**. Systems engineering as a method to solve problems. Introduction to the fundamental systems engineering principles, processes, and methodologies used to analyze, design, develop, and deploy complex, sustainable systems. Focuses on systems engineering as a logical, disciplined, systematic, and coherent approach to the design and development of a system, across the full life cycle of the system. Special emphasis is made on the concepts, methods, and activities used to analyze systems, to define and allocate requirements, to transform requirements into a system design, and to verify and validate the system.

## 6.4 Program sequence

First Year

| Fall | | | Spring | | |
|---|---|---|---|---|---|
| AERN 15300 | Introduction to Engineering Analysis Using Matlab | 3 | AERN 15500 | Introduction to Aerospace Engineering | 3 |
| COMM 15000 | Introduction to Human Communication | 3 | MATH 12002 | Analytics Geometry and Calculus I | 5 |
| TECH 13580 | Engineering Graphics I | 3 | PHY 23101 | General University Physics I | 5 |
| UC 10097 | Destination Kent State: First Year Experience | 1 | TECH 20002 | Materials and Processes I | 3 |
| Kent Core Requirement | | 3 | | | |
| Kent Core Requirement | | 3 | | | |
| | | **16** | | | **16** |

Second Year

| Fall | | | Spring | | |
|---|---|---|---|---|---|
| AERN 20000 | Professional Development in Aeronautics I | 1 | AERN 35040 | Aircraft Systems I | 3 |
| AERN 25200 | Statics | 2 | MATH 22005 | Analytic Geometry and Calculus III | 4 |
| MATH 12003 | Analytic Geometry and Calculus II | 5 | TECH 21021 | Survey of Electricity and Electronics | 4 |
| PHY 23102 | General University Physics II | 5 | ECON 22060 | Principles of Microeconomics | 3 |
| Kent Core Requirement | | 3 | | | |
| | | **16** | | | **14** |

Third Year

| Fall | | | Spring | | |
|---|---|---|---|---|---|
| AERN 45030 | Aircraft Systems II | 3 | AERN 30000 | Professional Development in Aeronautics II | 1 |
| AERN 45150 | Applied Flight Dynamics I | 3 | AERN 35150 | Aircraft Structures | 3 |
| TECH 33031 | Programmable Logic Controllers | 3 | AERN 45121 | Aerospace Propulsion for Engineering and Eng. Technology | 3 |
| TECH 33111 | Strength of Materials | 3 | TECH 33032 | Programmable Logic Controllers II | 3 |
| Kent Core Requirement | | 3 | TECH 33040 | Motors and Controllers | 3 |
| | | | Kent Core Requirement | | 3 |
| | | **15** | | | **16** |

Fourth Year

| Fall | | | Spring | | |
|---|---|---|---|---|---|
| AERN 45151 | Applied Flight Dynamics II | 3 | AERN 45850 | Aircraft Design II | 3 |
| AERN 45291 | Aerospace Senior Seminar | 1 | TECH 47200 | Systems Engineering | 3 |
| AERN 45700 | Aircraft Design | 3 | AERN Elective | | 3 |
| TECH 43030 | Mechatronics | 3 | AERN Elective | | 3 |
| Kent Core Requirement | | 3 | Kent Core Requirement | | 3 |
| | | **13** | | | **15** |

### 6.5 Alternative delivery options:

The aeronautical systems engineering technology major neither will be offered online (fully or hybrid) nor using a flexible or accelerated delivery model.

### 6.6 Off-site program components (please check all that apply):

☒ Co-op/Internship/Externship ☐ Student Teaching ☐ Other
☐ Field Placement ☐ Clinical Practicum

While a co-op/internship is not a requirement of the aeronautical systems engineering technology program at this time, in consideration of the university's experiential learning requirement and in support of student career progression and programmatic assessment requirements, the college will seek to formalize as many internship opportunities in aeronautical systems engineering technology as possible. Kent State University offers a cooperative education program for its undergraduates.

## SECTION 7: ASSESSMENT AND EVALUATION

### 7.1 Program assessment

***Describe the policies and procedures in place to assess and evaluate the proposed program. In your response, include the following: name of the unit/position responsible for directing assessment efforts; description of any committees or groups that assist the unit; description of the measurements used; frequency of data collection; frequency of data sharing; and how the results are used to inform the institution and the program.***

The senior academic program director of the Aeronautical Systems Engineering Technology major will direct assessment efforts. Committees or groups that assist the efforts include the Industry Advisory Board, Aeronautics Advisory Committee, college faculty and staff, current undergraduate and graduate students; alumni and employers.

The aeronautical systems engineering technology faculty will conduct focus groups, surveys and course data reports at the conclusion of each semester. The course data reports will be completed each semester; the review and revision of programmatic goals and objectives will be completed bi-annually. The data will be shared annually. Results will be used to inform the institution and the program of any required modification and/or changes to the existing program to include academic policies, prerequisites, course sequencing and addition or deletion of any courses.

### 7.2 Measuring student success

***Describe the policies and procedures in place to measure individual student success in the proposed program. In your response, include the following: name of the unit/position responsible for directing these efforts; description of any committees or groups that assist the unit; description of the measurements used; frequency of data collection; frequency of data sharing; how the results are used to inform the student as they progress through the program; and initiatives used to track student success after program completion.***

The senior academic program director of the Aeronautical Systems Engineering Technology major will direct student success efforts. Committees or groups that assist the efforts include the Industry Advisory Board, Aeronautics Advisory Committee, college faculty and staff, current undergraduate and graduate students; alumni and employers.

Program faculty will conduct focus groups, surveys and course data reports at the conclusion of each semester. In addition, academic reports will be compiled of students' average GPA, course completion rates, etc. The course data reports will be completed and shared each semester.

The college's aeronautics division hosts a student information session at the beginning of each semester; communicates via email announcements, posts updates on the advising announcement board, and solicits faculty announcements in each respective classroom;

Initiatives to track graduates' success include graduate surveys, employer surveys, *Aero Flyer* newsletter (maintaining engagement with alumni).

## SECTION 8: FACULTY

### 8.1 Faculty appointment policies

***Describe the faculty designations available (e.g., professor, associate professor, adjunct, instructor, clinical) for the proposed program's faculty. In your response, define/describe the differences between the designations.***

Full professor: As with the associate professorship, a faculty member must possess the terminal degree in the discipline before promotion consideration. Exceptions can be made in particular cases, provided that such exceptions can be justified by the candidate's unit and are approved by the college dean (if applicable) and the provost. A faculty member will usually not be considered for advancement to this rank until completion of five years as an associate professor, but in extraordinary cases may be considered after completion of fewer years as an associate professor. A non-tenured faculty member applying for promotion to the rank of full professor must also undergo a successful tenure review.

Associate professor: This is one of the two senior tenure-track ranks in academia; accordingly, a faculty member must possess the terminal degree in the discipline before promotion consideration. Exceptions can be made in particular cases, provided that such exceptions can be justified by the candidate's unit and are approved by the college dean (if applicable) and the provost. A faculty member will usually not be considered for advancement to this rank until completion of four years as an assistant professor, but in extraordinary cases may be considered

after completion of fewer years as an assistant professor. A non-tenured faculty member applying for promotion to the rank of associate professor must also undergo a successful tenure review.

Assistant professor: A tenure-track assistant faculty member will not be considered for advancement to this rank until either completion of three years as an instructor and possession of at least the master's degree, or until the academic credentials minimally required for initial appointment at the assistant professor's level are achieved.

Lecturer: This rank is intended for persons initially hired as full-time, non-tenure-track who do not possess the terminal degree in their discipline or a related field, and may not have the credentials to qualify as an associate lecturer or senior lecturer. Full-time, non-tenure-track lecturers are hired by the college dean in consultation with the College Advisory Committee and the associated academic program area coordinator. Full-time, non-tenure-track lecturers may vote and serve on some college committees.

Adjunct: This faculty status is an honorific designation denoting the affiliation with a Kent State University program or department of an individual whose primary employment is from outside the university or the department in which adjunct status is held.

***Describe the credentialing requirements for faculty who will be teaching in the program (e.g., degree requirements, special certifications or licenses, experience).***

All tenure-track faculty in the aeronautical systems engineering technology program must have a PhD in aerospace engineering or a related field, or be a doctoral candidate in the same category with the expectation of completion within one year of hiring.

***Describe the institution's load/overload policy for faculty teaching in the program.***

Workload expectations and specification of workload equivalents of classroom instructional assignments are incorporated in each academic unit's or campus' section of its faculty handbook.

Assignment to instructional overloads for additional compensation is neither a regular expectation nor an obligation of employment of a faculty member. An overload occurs when, and only when, a person exceeds the number of hours which are listed as his/her load in his/her current contract. In instances in which an overload assignment is authorized by the Office of the Dean, the assignment ordinarily may not exceed one additional course for a semester. Exceptions to this rule require prior written authorization from the Office of the Provost upon recommendation from the appropriate dean.

***Indicate whether the institution will need to identify additional faculty to begin the proposed program. If additional faculty members are needed, describe the appointment process and provide a timeline for hiring such individuals.***

There is no need for additional faculty at this time.

**8.2 Program faculty**

***Provide the number of existing faculty members available to teach in proposed program.***

Full-time: 12 Less than full-time: 1

***Provide an estimate of the number of faculty members to be added during the first two years of program operation.***

Full-time: 0 Less than full-time: 0

### 8.3 Expectations for professional development/scholarship

***Describe the institution's general expectations for professional development/scholarship activities by the proposed program's faculty. In your response, describe any differences in the expectations for tenure-track vs. non tenure-track faculty and for full-time vs. part-time faculty. Indicate the financial support provided for such activities. Include a faculty handbook outlining the expectations and documenting support as an appendix item.***

Expectations for professional development and scholarship activities vary in accordance with the collective bargaining agreements for both the tenured/tenure-track and non-tenure track faculty. Funding is available for both.

Additionally, Kent State's Center for Teaching and Learning provides a resource to all university faculty for teaching, learning innovation and educational support. The center's four main areas of service are to:

- Connect, network and support continuity in opportunities for faculty to explore, research and support student learning.
- Serve as a portal of all information and services related to faculty at Kent State University.
- Offer expertise and consultation related to specific areas of scholarship and professional issues.
- Provide peer review and guidance on teaching innovations and improvement.

The faculty handbook for the College of Applied Engineering, Sustainability and Technology is in Appendix G.

### 8.4 Faculty matrix

***Complete a faculty matrix for the proposed program. A faculty member must be identified for each course that is a required component of the curriculum. If a faculty member has not yet been identified for a course, indicate that as an "open position" and describe the necessary qualifications in the matrix.***

Faculty listed below will teach the major core requirements. See Appendix H for each faculty member's curriculum vita.

* Number of courses taught by the faculty member each year at all campuses

| Name of instructor | Rank or title | Full/ part | Degree, discipline, institution, year | Years teach | Additional expertise | Course taught | Load * |
|---|---|---|---|---|---|---|---|
| Jason Boergerhoff | Assistant Professor | FT | MS, University of North Dakota, 2010 | 5 | | AERN 45291 | 8 |
| Darwin Boyd | Assistant Professor | FT | PhD, Applied Physics, Kent State University, 1991 | 21 | | TECH 33031<br>TECH 33032<br>TECH 45030 | 4 |

| Name of instructor | Rank or title | Full/ part | Degree, discipline, institution, year | Years teach | Additional expertise | Course taught | Load * |
|---|---|---|---|---|---|---|---|
| John C. Duncan | Assistant Professor | FT | PhD, Evaluation and Measurement, Kent State University, 1996 | 26 | Aero engineering experience with Boeing, Lockheed Martin, Northrop | AERN 25200<br>AERN 45121<br>AERN 45151<br>TECH 47200 | 4 |
| Michael R. Fisch | Assistant Professor | FT | PhD, Applied Physics, Harvard University, 1980 | 31 | Research in mechanical properties of materials | TECH 33111 | 4 |
| Timothy Palcho | Associate Professor | FT | MS, Mountain State University, 2009 | 10 | | AERN 30000 | 8 |
| Robert Pohlchuck | Adjunct | PT | MA, Technology, Kent State University, 1995 | 6 | | TECH 13580 | 6 |
| James E. Ripple | Assistant Professor | FT | Master of Aeronautical Science, Embry-Riddle Aeronautical University, 2007 | 9 | Leadership, management, operations | AERN 20000<br>AERN 35040<br>AERN 45030 | 8 |
| Shin-Min (Simon) Song | Professor | FT | PhD, Mechanical Engineering, Ohio State University, 1984 | 32 | Robotics, Mechanisms | TECH 33040 | 4 |
| D. Blake Stringer | Assistant Professor | FT | PhD, Mechanical and Aerospace Engineering, University of Virginia, 2008 | 5 | 20-year military (12 in academic and research and development) | AERN 15300<br>AERN 45150<br>AERN 45700<br>AERN 45850 | 4 |
| Trent A.W. True | Lecturer | FT | Masters of Technology, Kent State University, 2007 | 2.5 | 8 years industry | TECH 20002 | 8 |
| Roberto M. Uribe-Rendon | Professor | FT | PhD, Physics, National Autonomous University of Mexico, 1986 | 41 | Former associate director for North East Ohio Electron Beam | TECH 20121 | 4 |
| John Zehentbauer | Adjunct | PT | Master of Education, Vocational Education, Kent State University, 2000 | 17 | | AERN 35150 | 2 |
| Open Position | Assistant Professor | FT | Master's degree required | | | AERN 15500 | 4 |

## SECTION 9: LIBRARY RESOURCES AND INFORMATION LITERACY

### 9.1 Library resources

***Describe the involvement of a professional librarian in the planning for the program (e.g., determining adequacy of current resources, working with faculty to determine the need for additional resources, setting the budget for additional library resources/services needed for the program).***

Kent State's science librarian, determined whether the collection of print and electronic resources where adequate enough to support the program proposed. The science librarian works closely with the library representative from the college to determine the need for additional resources as needed, and fulfills direct requests from faculty in need of additional resources. There is an annual budget allocated by the library and administered by the science librarian to

support the resource needs of the college. In addition, the science librarian teaches information literacy classes that focus on the usage of these materials.

***Describe the library resources in place to support the proposed program (e.g., print, digital, collections, consortia, memberships).***

**Book collections:** The existing book collection at the Kent State University Libraries will strongly support the proposed areas of study and research. Existing services the library offers will allow for continued development of this collection. Faculty members have the ability to participate in the selection of new books and journals for the collection. The Library allocates an annual budget for Monograph and journal purchases for CAEST. The Science Librarian coordinates requests for these purchases. In addition, for materials not available in our collection, faculty and students may request books through the Interlibrary Loan system.

**Journals and subscriptions:** Another area of collection support is the University Library's collection of academic periodicals. This collection of journals supports most of the needs of faculty and students research. The Collection Management Librarian and Science Librarian of the Library regularly review interlibrary loan reports from collage to identify new collection needs. The following journal titles currently subscribed to at the library are relevant or related to the proposal:

ACM SIGBED Review
ACM SIGCOMM Computer Communication Review
ACM SIGMOBILE Mobile Computing and Communications Review
ACM Transactions on Design Automation of Electronic Systems (TODAES)
ACM Transactions on Embedded Computing Systems (TECS)
ACM Transactions on Internet Technology (TOIT)
ACM Transactions on Sensor Networks (TOSN)
Advanced Functional Materials
Advanced Materials For Optics and Electronics
AEU - International Journal of Electronics and Communications
Analog Integrated Circuits and Signal Processing
Annals of Telecommunications - Annales Des Télécommunications
Applied Signal Processing
Applied Superconductivity
Applied Surface Science
Bell Labs Technical Journal
Bioenergy Research
Biomagnetic Research and Technology
Biomedical Signal Processing and Control
Biometric Technology Today
Campus-Wide Information Systems
Card Technology Today
Circuit World
Circuits, Systems, and Signal Processing
COMPEL : The International Journal for Computation and Mathematics in Electrical and Electronic Engineering
Information Fusion
Information Management Report
International Journal of Adaptive Control and Signal Processing
International Journal of Circuit Theory and Applications
International Journal of Communication Systems
International Journal of Electrical Power & Energy Systems
International Journal of Emerging Electric Power Systems
International Journal of Imaging Systems and Technology
International Journal of Infrared and Millimeter Waves
Journal of Electronics (China)
Journal of Electrostatics
Journal of Infrared, Millimeter, and Terahertz Waves
Journal of Materials Science: Materials in Electronics
Journal of Network and Computer Applications
Journal of Network and Systems Management
Journal of Optical and Fiber Communications Reports
Journal of Optical Communications and Networking
Journal of Optical Networking
Journal of Optics B: Quantum and Semiclassical Optics
Journal of Radio Studies
Journal of Russian Laser Research
Journal of Signal Processing Systems
Journal of the European Mathematical Society
JSTOR
The Journal of VLSI Signal Processing
Lab On a Chip
Materials Science and Engineering: B
Materials Science in Semiconductor Processing

Computational Mechanics
Computer Communications
Computer Networks and ISDN Systems
Computer Networks
Computers & Electrical Engineering
Computing
Convergence
Digital Signal Processing
Displays
Electric Power Systems Research
Electrical Engineering in Japan
Electrical Engineering
Electrical Engineering
Electrical Technology
Electronic News
Electronics and Communications in Japan (parts I, II, III: Communications, Electronics, Fundamental Electronic Science)
Energy Conversion and Management
Engineering Failure Analysis
Engineering With Computers
European Transactions On Electrical Power
Finite Elements in Analysis and Design
Fuel Cells Bulletin
Fuel Cells
International Journal of Micrographics & Optical Technology
International Journal of Microwave and Millimeter-Wave Computer-Aided Engineering
International Journal of Rf and Microwave Computer-Aided Engineering
International Journal of Satellite Communications and Networking
International Journal of Satellite Communications
International Journal of Wireless Information Networks
International Journal On Critical Infrastructure Protection
Internet Research: Electronic Networking Applications and Policy
Journal of Broadcasting & Electronic Media
Journal of Communications Technology and Electronics
Journal of Computational Electronics
Journal of Computer-Aided Molecular Design
Journal of Computer-Mediated Communication
Journal of Electroceramics
Journal of Electronic Materials
Journal of Electronic Testing
Mathematics of Control, Signals, and Systems
Microelectronic Engineering
Microelectronics and Reliability
Microelectronics International
Microelectronics Journal (incorporating Journal of Semicustom Ics)
Microwave and Optical Technology Letters
Multidimensional Systems and Signal Processing
Optical and Quantum Electronics
Optical Fiber Technology
Optical Memory and Neural Networks
Optical Networks Magazine
Optical Switching and Networking
Optics & Laser Technology
Opto-Electronics Review
Optoelectronics, Instrumentation and Data Processing
Philips Journal of Research
Philosophical Transactions: Mathematical, Physical & Engineering Sciences
Physical Communication
Plasmas and Polymers
Progress in Photovoltaics: Research and Applications
Quantum and Semiclassical Optics: Journal of the European Optical Society Part B
Radioelectronics and Communications Systems
Radiophysics and Quantum Electronics
Russian Electrical Engineering
Russian Microelectronics
Semiconductor Science and Technology
Semiconductors
Semiconductors
Sensors and Actuators A: Physical
Sensors and Actuators B: Chemical
Sensors Update
Signal, Image and Video Processing
Signal Processing
Silicon Chemistry
Solar Energy Materials and Solar Cells
Soldering & Surface Mount Technology
Solid-State Electronics
Superconductor Science and Technology
Superlattices and Microstructures
Surface Engineering and Applied Electrochemistry
Telecommunication Systems
Telecommunications Policy
Telematics and Informatics
Wind Energy

**Database collection:** The University Library provides access to several databases. The database collection is evaluated each year to ascertain its usefulness to faculty and students, when to acquire new databases, and replace those not of use.

- ACM Digital Library: Provides bibliographic information, abstracts, index terms, reviews and the full-text for ACM conference proceedings. ACM journals, magazines and newsletters are also available at this site, as well as through the OhioLINK Electronic Journal Center.

- AccessScience: An online encyclopedia that provides full-text access to articles, research updates and dictionary terms in all areas of science and technology. Also contains biographies, weekly updates on hot topics and discoveries, a student center with resource guides and links to related sites. Updated daily.
- Computers and Applied Sciences Complete: Incorporates Computer Science Index, Computer Source, Information Science and Technology Abstracts, Internet and Personal Computing Abstracts and includes academic journals, professional publications and other reference sources. Subject areas include the many engineering disciplines, computer theory and new technologies.
- Derwent Innovations Index: Available through the ISI Web of Knowledge interface. Merges the Derwent World Patents Index with the Derwent Patents Citation Index. Provides access to more than 14,800,000 patents with links to cited and citing patents, cited articles and full-text patent data sources. Gives users an overview of inventions in three categories: chemical, electrical and electronic and engineering.
- IEEE/IET Electronic Library (IEL): More than three million full text IEEE journals, conferences and standards, IET journals and conferences, VDE conference papers and all IEEE standards except for the drafts. All content back to 1988 with selected content back to 1872.
- Inspec: Provides access to the world's scientific and technical literature in physics, electrical engineering, electronics, communications, control engineering, computers and computing and information technology; also has significant coverage in areas such as materials science, aeronautics, oceanography, nuclear engineering, geophysics, biomedical engineering and biophysics. Searches Physics Abstracts and more.
- Science Online: Science Online from Facts on File (not the journal Science published by AAAS) presents information on a broad range of scientific disciplines through extensive definitions, essays, diagrams, biographies and experiments.
- Textile Technology Complete: Textile Technology Complete is a scholarly and professional database covering scientific and technological aspects of textile production and processing. Containing over 400 periodical titles, it also draws on current technical reports, books and trade literature. Also includes resources about apparel, home furnishings and polymer industries.
- Wright Brothers Collection: Wright Brothers Collection documents the invention of the airplane, the lives of the Wright Family and the Wrights' flying exhibitions in Europe and the United States. The collection provides thorough coverage of the Wrights' early inventive period documenting their early gliders and flight-testing in both North Carolina and Ohio.

***Describe any additional library resources that will be needed to support the request and provide a timeline for acquiring/implementing such services. Where possible, provide a list of the specific resources that the institution intends to acquire, the collaborative arrangements it intends to pursue, and monetary amounts the institution will dedicate to the library budget to support and maintain the proposed program.***

The current resources available aforementioned are more than enough to support the program proposed. However, any new resources identified overtime will be acquired as soon as the need is discovered. The science librarian will coordinate the acquisition of said resources by collaborating with the library collection management team. As previously mentioned, the library allocates, and the science librarian administers, the budget to support the academic needs of the students and faculty of College of Applied Engineering, Sustainability and Technology.

### 9.2 Information literacy

***Describe the institution's intent to incorporate library orientation and/or information literacy into the proposed program. In your response, describe any initiatives (e.g., seminars, workshops, orientations, etc.) that the institution uses or intends to use for faculty and students in the program.***

The science librarian will conduct information literacy courses, workshops and seminars in support of college faculty and students. For incoming freshman, there will be a course designed to help students learn to select a topic for research, locate reference materials, scholarly books, scholarly journal articles and scholarly websites relevant to their topic.

Along the way, students become familiar with the Kent State University Libraries and its catalog, online databases and sources of good scholarly information on the web. Students learn to cite sources appropriately in either MLA or APA style. Strong emphasis is given to learning to evaluate information to determine how appropriate it is for research and whether it is credible, scholarly information. Issues of copyright, plagiarism and the impact of the Internet on research will be covered.

In addition the science librarian teaches classes where the content is tailored to subject-specific research, and integrates with the curriculum of the proposed program. The science librarian works with college faculty to tailor a session to the specific needs of their courses. The courses are continually updated in order to stay abreast of current developments in pedagogy and instructional technology.

## SECTION 10: BUDGET, RESOURCES, AND FACILITIES

### 10.1 Resources and facilities

***Describe additional resources (e.g., classrooms, laboratories, technology) that will be needed to support the proposed program and provide a timeline for acquiring/implementing such resources.***

As this is an existing program with sufficient resources, no additional resources are needed to support the program as a major at this time.

### 10.2 Budget/financial planning

***Complete the table to describe the financial plan/budget for the first three years of program operation.***

| Fiscal Impact Statement for New Degree Programs | | | | |
|---|---|---|---|---|
| | **Year 1** | **Year 2** | **Year 3** | **Year 4** |
| **I. Projected Enrollment** | | | | |
| Headcount full time (12 credit hours/semester) | 30 | 63 | 101 | 143 |
| Headcount part time (6 credit hours/semester) | 5 | 10 | 15 | 20 |
| Full-time equivalent (FTE) enrollment | 32.5 | 68 | 108.5 | 153 |
| **II. Projected Program Income** | | | | |
| Tuition (paid by student or sponsor) | 338,524 | 723,603 | 1,180,581 | 1,707,571 |
| Expected state subsidy | 152,804 | 326,622 | 532,895 | 770,769 |
| Externally funded stipends, as applicable | 0 | 0 | 0 | 0 |
| Other income (described in narrative section below) | 45 | 91 | 112 | 90 |
| **Total Projected Program Income** | **$491,373** | **$1,050,316** | **$1,713,588** | **$2,478,430** |
| **III. Program Expenses** | | | | |
| New Personnel | | | | |
| Instruction (technical, professional and general education ) | | | | |
| Full time:**1** | 0 | 112,888 | 225,776 | 338,664 |
| Part time: **1** | 5,768 | 9,336 | 48,471 | 83,117 |
| Non-instruction (indicate roles in narrative section below) | | | | |
| Full time: **0** | 0 | 0 | 0 | 0 |
| Part time: **0** | 0 | 0 | 0 | 0 |
| New facilities/building/space renovation | 0 | 0 | 0 | 0 |
| Scholarship/stipend support | 12,000 | 24,000 | 36,000 | 48,000 |
| Additional library resources | 0 | 0 | 0 | 0 |
| Additional technology or equipment needs | 25,000 | 50,000 | 100,000 | 200,000 |
| Other expenses (if applicable, describe in narrative section below) | 439,405 | 838,682 | 1,256,236 | 1,743,136 |
| **Total Projected Expense** | **482,173** | **1,034,906** | **1,666,483** | **2,412,917** |

**Budget Narrative:** Projected program income accounts for responsibility-centered management (RCM); included "other income" accounts for moderate special course fees. As supported in Section 9, no additional library resources are required.

| **Other expenses** | **Year 1** | **Year 2** | **Year 3** | **Year 4** |
|---|---|---|---|---|
| Allocation for expenses covered by general fees | 54,755 | 117,040 | 190,954 | 276,193 |
| Transfers to other RCM units | 315,996 | 523,219 | 668,080 | 845,091 |
| RCM overhead charges | 53,654 | 182,423 | 380,202 | 603,852 |
| Targeted marketing | 10,000 | 10,000 | 10,000 | 10,000 |
| Living learning community and retention-related costs | 5,000 | 6,000 | 7,000 | 8,000 |

## APPENDICES

| Appendix | Description |
|---|---|
| A | College's Aeronautics Division Organizational Chart |
| B | Aeronautics Senior Program Director Maureen McFarland's Curriculum Vitae |
| C | Letter of Support from the Ohio Aerospace Institute |
| D | Catalog Copy for Aeronautical Systems Engineering Major |
| E | Major Core Syllabi |
| F | Aeronautical Systems Engineering Technology Semester-by-Semester Roadmap |
| G | Faculty Handbook – College of Applied Engineering, Sustainability and Technology |
| H | Program Faculty Curriculum Vita |

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Kent State University is committed to continual support of the delivery of the Bachelors of Science degree in Aeronautical Systems Engineering Technology. If Kent State decides in the future to close the program, the university will provide the necessary resources and means for matriculated students in the program to complete their degree.

Kent State University verifies that the information in the application is truthful and accurate.

Respectfully,

Todd A. Diacon
Senior Vice President for Academic Affairs and Provost
Kent State University