

# AERONAUTICS (AERN)

**AERN 15000 INTRODUCTION TO AERONAUTICS 3 Credit Hours**  
Introduction to aeronautical and aerospace technology, including historical development, underlying science and technical applications. The past, present and future social, economic, technical and political impact of aviation are also explored.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 15250 FAA ORIENTATION 3 Credit Hours**  
Introduction to the Federal Aviation Administration with particular emphasis on its role and impact on air traffic management and the National Airspace System (NAS). Course addresses the unique aspects and requirements of federal employment, as well as federal regulations affecting flight operations and the FAA's associated supporting agencies.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 15300 INTRODUCTION TO ENGINEERING ANALYSIS USING MATLAB® 3 Credit Hours**  
Introduction to basic concepts in engineering analysis using the Matlab® computing language, the industry-standard "first language" for engineers. Introduction to problem solving, algorithm coding and development, debugging, analysis and interpretation.

**Prerequisite:** None.

**Schedule Type:** Laboratory, Lecture, Combined Lecture and Lab

**Contact Hours:** 2 lecture, 2 lab

**Grade Mode:** Standard Letter

**AERN 15500 INTRODUCTION TO AEROSPACE ENGINEERING 3 Credit Hours**  
Fundamentals of fluid mechanics, applied aerodynamics, propulsion systems, airplane performance, stability, orbital motion, and launch vehicle performance.

**Pre/corequisite:** MATH 12002.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 15740 ELEMENTS OF FLIGHT THEORY 5 Credit Hours**  
Basic instruction in all areas which gives the student aeronautical knowledge required for a private pilot certificate.

**Corequisite:** AERN 15741.

**Schedule Type:** Lecture

**Contact Hours:** 5 lecture

**Grade Mode:** Standard Letter-IP

**AERN 15741 PRIVATE PILOT FLIGHT 3 Credit Hours**  
Flight course designed to fulfill FAA requirements for private pilot certificate. With special approval, this course may be repeated only once. Student is required to spend a minimum of 2 hours each day, five days a week, at the airport, until course requirements have been attained. When not flying, the student goes through personalized ground instruction. Minimum FAA flight time requirements towards the private pilot certificate is 48 hours. Actual flight training may exceed 48 hours. Special course fees apply. Please visit [www.kent.edu](http://www.kent.edu). Students must obtain Student Pilot Certificate and have and maintain valid medical and TSA approval prior to starting course.

**Prerequisite:** Must be a Flight Technology (FLGT) concentration within the Aeronautics (AERN) major.

**Corequisite:** AERN 15740 and MATH 11010.

**Schedule Type:** Flight Training

**Contact Hours:** 9 other

**Grade Mode:** Standard Letter-IP

**AERN 15742 PRIVATE PILOT HELICOPTER FLIGHT 3 Credit Hours**  
Flight course designed to fulfill Federal Aviation Administration (FAA) requirements for the private pilot helicopter certificate. This course may only be repeatable twice. Student is required to spend 1.5 hours each day, five days a week, at the airport, until the FAA minimum requirements are attained. When not flying, the student goes through personalized ground instruction with an assigned flight instructor. Minimum FAA flight time requirements towards the Private Pilot Helicopter Flight Certificate is 40 hours. Actual flight training may exceed 40 hours. Students must obtain Student Pilot Certificate prior to starting course. Students must also have and maintain valid medical and TSA approval prior to starting course.

**Prerequisite:** Minimum 2.500 cumulative GPA; and AERN 15740; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Corequisite:** AERN 35101.

**Schedule Type:** Flight Training

**Contact Hours:** 5.5 other

**Grade Mode:** Standard Letter-IP

**AERN 15743 PRIVATE PILOT HELICOPTER FLIGHT ADD-ON 2 Credit Hours**  
Flight course designed to fulfill Federal Aviation Administration (FAA) requirements for the private pilot helicopter certificate. This course may only be repeatable twice. Student is required to spend 1.5 hours each day, five days a week, at the airport, until the FAA minimum requirements are attained. When not flying, the student goes through personalized ground instruction with an assigned flight instructor. Minimum FAA flight time requirements towards the Private Pilot Helicopter Flight Certificate is 40 hours. Actual flight training may exceed 30 hours.

**Prerequisite:** Minimum 2.500 cumulative GPA; and AERN 15740 and 15741; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Corequisite:** AERN 35101.

**Schedule Type:** Flight Training

**Contact Hours:** 4.86 other

**Grade Mode:** Standard Letter-IP

**AERN 15745 NON-PILOT ELEMENTS OF FLIGHT THEORY 3 Credit Hours**

Basic instruction in areas to include: Federal Regulations, navigation, communication, airspace, weather, basic aerodynamics, and aero-medical factors which give the student a foundation in aeronautics. This course does not satisfy the Federal Aviation Regulation requirement for endorsement to take the Airman Knowledge Exam for a the private pilot nor does it satisfy the Aircraft Dispatch minor.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 20000 PROFESSIONAL DEVELOPMENT IN AERONAUTICS I 1 Credit Hour**

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.

**Prerequisite:** Sophomore standing.

**Schedule Type:** Lecture

**Contact Hours:** 1 lecture

**Grade Mode:** Standard Letter

**AERN 25100 INTRODUCTION TO AVIATION MANAGEMENT 3 Credit Hours**

Introduction to the day-to-day concepts of Airline, Airport, and other businesses pertaining to the aviation industry.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 25200 STATICS 2 Credit Hours**

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

**Prerequisite:** MATH 12003 and PHY 23101.

**Schedule Type:** Lecture

**Contact Hours:** 2 lecture

**Grade Mode:** Standard Letter

**AERN 25250 ELEMENTS OF AVIATION WEATHER 3 Credit Hours**

Aviation weather provides a comprehensive look at the Earth's atmosphere, general patterns and specific phenomena, and a focus on weather as related to flight.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 25251 WEATHER INFORMATION SYSTEMS 3 Credit Hours**

Introduction to various weather sensing equipment and the systems that deliver weather information to various users. An in-depth look at the National Weather Service, NOAA, NASA, FAA and commercially available weather information systems.

**Prerequisite:** AERN 25250 or GEOG 31062.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 25252 THUNDERSTORMS AND SEVERE WEATHER 3 Credit Hours**

Analysis and forecast of thunderstorm and severe convective weather activity development and movement. Analysis of atmospheric information and clouds, radar, computer models, and charts. A study of mid-latitude cyclones and some focused study on tropical depressions, hurricanes, tornadoes, dust and sand storms. Study includes geographic effects and cyclone life cycles. Provides an in-depth look at the development of severe weather products for aviation such as AIRMET, SIGMET and Convective SIGMET.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 25350 FUNDAMENTALS OF AIR TRAFFIC CONTROL 2 Credit Hours**

Introduction to the National Airspace System (NAS) and the orders, manuals, and procedures associated with the purposes and directives of the air traffic control environment. Introduces and discusses those areas of required knowledge of the AT-Basics needed to become an Air Traffic Controller. These topics include the principles of flight, the FARs, navigation, aviation weather and other ATC related areas.

**Prerequisite:** Aeronautics (AERN) major.

**Corequisite:** AERN 25351.

**Schedule Type:** Lecture

**Contact Hours:** 2 lecture

**Grade Mode:** Standard Letter

**AERN 25351 FUNDAMENTALS OF AIR TRAFFIC CONTROL LABORATORY 1 Credit Hour**

Introductory laboratory course on air traffic management and the National Airspace System, the orders, manuals and procedures associated with the puposes and directives of the air traffic control environment. To include purposes and responsibilities of the ATC system.

**Prerequisite:** Aeronautics (AERN) major.

**Corequisite:** AERN 25350.

**Schedule Type:** Laboratory

**Contact Hours:** 2 lab

**Grade Mode:** Standard Letter

**AERN 25400 DYNAMICS 3 Credit Hours**

Kinematics and kinetics of rigid bodies in planar motion and an introduction to the kinematics and kinetics of rigid bodies in three-dimensional motion.

**Prerequisite:** AERN 25200; and MATH 22005 or MATH 32051.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 25500 AERODYNAMICS FOR ENGINEERS 3 Credit Hours**

Basic fluid dynamics concepts, conservation laws, potential, airfoil and wing analysis. Boundary layers on plates and airfoils. Pressure gradients. Introduction to turbulent and vortex-dominated flows.

**Prerequisite:** AERN 15500 and MATH 22005.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 25743 COMMERCIAL PILOT FLIGHT I 2 Credit Hours**

Advanced flight course providing flight instruction for the commercial pilot. Primary emphasis is on cockpit resource management, advanced navigational practices and basic instrument instruction. With special approval, this course may be repeated only once. Student is required to spend a minimum of two hours daily, four days a week, at the airport until all course requirements have been attained. When not flying, the student goes through personalized ground instruction. Special course fees apply. Please visit [www.kent.edu/cae](http://www.kent.edu/cae) for a list of fees.

**Prerequisite:** A minimum C grade in both AERN 15740 and AERN 15741; and minimum 2.500 overall GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Corequisite:** AERN 25250.

**Schedule Type:** Flight Training

**Contact Hours:** 2 other

**Grade Mode:** Standard Letter-IP

**AERN 25800 INTRODUCTION TO UNMANNED AIRCRAFT SYSTEMS 3 Credit Hours**

An overview of unmanned aircraft systems. Course topics include the history, development, and evolution of unmanned aircraft; current and forecast trends and issues; capabilities and performance of unmanned aircraft; UAS applications; regulations governing unmanned aircraft systems; unmanned aircraft flight operations; and opportunities and career paths in unmanned aircraft systems.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 30000 PROFESSIONAL DEVELOPMENT IN AERONAUTICS II 1 Credit Hour**

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.

**Prerequisite:** AERN 20000; and Junior standing.

**Schedule Type:** Seminar

**Contact Hours:** 1 lecture

**Grade Mode:** Standard Letter

**AERN 35001 AIRCRAFT FABRICATION 3 Credit Hours**

The study and laboratory practice of government approved procedures used in the fabrication, repair and testing of certificated aircraft.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35020 AIRCRAFT PROPULSION SYSTEMS 3 Credit Hours**

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.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35021 RADAR SATELLITE WEATHER INFORMATION 3 Credit Hours**

A study of satellite and radar imagery. A focus on both passive and active remote sensing systems. Student develops an understanding of the properties of meteorological radar sensing, signal propagation and estimating precipitation. Provides an in-depth look at radar and satellite products and their application to aircrew operations. Emphasis is placed on real-time identification of weather phenomena affecting a flight in progress.

**Prerequisite:** AERN 25250 or GEOG 31062.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35022 WEATHER STRATEGY FOR AIRCREWS 3 Credit Hours**

Flying strategies for various weather conditions to include low ceilings and visibility, turbulence, cold weather, thunderstorms, and wind shear. An exploration of basic and advanced weather theory and how to get the best use of FAA and commercially available forecast products and briefing services. Course takes a condition-by-condition look at various hazardous weather phenomena.

**Prerequisite:** AERN 25250 or GEOG 31062.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35030 INTRODUCTION TO CORPORATE AVIATION 3 Credit Hours**

Introduces students to the business and corporate sectors of commercial aviation. Examines business and corporate aviation from the joint perspectives of operations and maintenance management as well as flight operations.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35031 AVIATION INDUSTRY REGULATIONS 3 Credit Hours**

This course will examine the functions of the regulatory agencies in the aviation industry. The evolution of Administrative Regulation, Federal Aviation Regulation and the rule making process.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35040 AIRCRAFT SYSTEMS I 3 Credit Hours**

In-depth study of various aircraft systems including electrical systems, environmental control systems, and fuel systems as applied to aircraft.

**Prerequisite:** PHY 13012.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35095 SPECIAL TOPICS IN AERONAUTICS 1-3 Credit Hours**

(Repeatable for credit) Specialized offerings of interest in response to emerging or needed curricular needs in aeronautics. Topics will be announced in the schedule of classes.

**Prerequisite:** Aeronautics (AERN) major and Sophomore standing.

**Schedule Type:** Lecture

**Contact Hours:** 1-3 lecture

**Grade Mode:** Standard Letter

**AERN 35101 HELICOPTER FLIGHT THEORY 3 Credit Hours**

Study of helicopter flight and operations that includes rotor system dynamics, control functions, major components, operation and performance.

**Prerequisite:** Aeronautics (AERN) major.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35150 AIRCRAFT STRUCTURES 3 Credit Hours**

Aircraft structural design investigations dealing with theory and applications in aviation.

**Prerequisite:** PHY 13001.

**Schedule Type:** Combined Lecture and Lab

**Contact Hours:** 3 other

**Grade Mode:** Standard Letter

**AERN 35200 THERMAL FLUID ENGINEERING 3 Credit Hours**

First and Second Law of Thermodynamics for closed and open systems.

Fundamentals of fluid mechanics and heat transfer.

**Prerequisite:** MATH 22005 or MATH 32051; and PHY 23101.

**Corequisite:** AERN 35201.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35201 THERMAL-FLUID ENGINEERING LABORATORY 1 Credit Hour**

Laboratory demonstrations and experiments for various heat transfer and fluid dynamics concepts.

**Prerequisite:** None.

**Corequisite:** AERN 35200.

**Schedule Type:** Lecture

**Contact Hours:** 2 lab

**Grade Mode:** Standard Letter

**AERN 35300 AEROSPACE VEHICLE PERFORMANCE 3 Credit Hours**

Performance analysis of fixed-wing aircraft, rotorcraft, and spacecraft. Equations of motion, evaluation of forces, and performance calculations. Steady and accelerated flight performance.

**Prerequisite:** AERN 25500; and MATH 32044 or MATH 32052.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35339 FIXED BASE OPERATOR OPERATIONS 3 Credit Hours**

A study of general aviation operations and the role of Fixed Base Operators in the National Aviation System; management functions; marketing; profit; cash flow; financing; human resources; organization; administration; management information systems; operations; maintenance; safety; liability; physical facilities; and the future of general aviation.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35340 AIRPORT MANAGEMENT 3 Credit Hours**

Introduction to the many functions that are involved in the operation and management of an airport. Includes an analysis of the development of the airport- airway system, airport legislation, airport planning and airport operations.

**Prerequisite:** AERN 15740 or 15745; and 25250.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35341 AIR TRANSPORTATION SYSTEMS 3 Credit Hours**

Descriptive course in airline operations as seen from the air carrier's business perspective. Emphasis is on business practices and techniques unique to aviation.

**Prerequisite:** none.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35342 TERMINAL OPERATIONS I 2 Credit Hours**

Intermediate level terminal operations course. Emphasis on tower operations at the clearance delivery, ground control, and local control positions. Topics covered will include, but not be limited to phraseology, procedures, LOAs and weather.

**Prerequisite:** AERN 25350 and AERN 25351; and AERN 15740 or

AERN 15745; and Aeronautics (AERN) major.

**Corequisite:** AERN 35345.

**Schedule Type:** Lecture

**Contact Hours:** 2 lecture

**Grade Mode:** Standard Letter

**AERN 35343 EN ROUTE I 3 Credit Hours**

Introduction to en route operations of air traffic control. Focus on the non-RADAR foundations of en route operations. Topics covered include, but are not limited to phraseology, maps, LOAs, rules and procedures in a non-RADAR environment.

**Prerequisite:** AERN 25250, AERN 25251, AERN 35342 and AERN 35345; and Aeronautics (AERN) major.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35345 TERMINAL OPERATIONS I LABORATORY 1 Credit Hour**

Application of terminal air traffic control operating principles explored in AERN 35342 Terminal Operations I.

**Prerequisite:** AERN 253550 and AERN 25351; and AERN 15740 or AERN 15745; and aeronautics (AERN) major.

**Corequisite:** AERN 35342.

**Schedule Type:** Laboratory

**Contact Hours:** 2 lab

**Grade Mode:** Standard Letter

**AERN 35400 SYSTEM DYNAMICS AND CONTROL 3 Credit Hours**

Dynamic modeling and response of systems with mechanical, hydraulic, electrical, and or thermal elements. Classical methods of feedback control system design and analysis.

**Prerequisite:** AERN 25500 and MATH 32044 or MATH 32052.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35500 SIGNALS AND CIRCUITS 3 Credit Hours**

An introduction to electric circuit elements and electronic devices and a study of circuits containing such devices. Both analog and digital systems are considered.

**Prerequisite:** AERN 35400 and PHY 23102.

**Corequisite:** AERN 35501.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35501 SIGNALS AND CIRCUITS LABORATORY 1 Credit Hour**

Laboratory demonstrations and experiments for electrical circuits, data acquisition, and signal measurements.

**Corequisite:** AERN 35500.

**Schedule Type:** Laboratory

**Contact Hours:** 2 lab

**Grade Mode:** Standard Letter

**AERN 35600 HIGH-SPEED AERODYNAMICS 3 Credit Hours**

Compressibility effects on airfoil and wing aerodynamics; supersonic potential flow; method of characteristics; boundary layer effects on aircraft performance.

**Prerequisite:** AERN 25500, AERN 35200 and MATH 32044 or MATH 32052.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35644 INSTRUMENT FLIGHT THEORY 3 Credit Hours**

Course instruction on Instrument Flight to include, navigation facilities (both ground and aircraft), weather theory and weather specific to instrument meteorological conditions, weather charts and sources, cross-country flight planning for IFR, FAA regulations specific to IFR flight, Charts for Instrument Flight, Aircraft Performance, Decision Making, Aircraft Systems and Instruments related to IFR Flight, and Instrument Flight techniques and procedures. This course meets the requirements for endorsement to take the FAA Airman Knowledge Exam for an Instrument Rating and satisfies the requirements of the Training Course Outline approved by the FAA.

**Prerequisite:** AERN 15740 and AERN 25250; and Aeronautics (AERN) major.

**Corequisite:** AERN 35645.

**Schedule Type:** Flight Training

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35645 INSTRUMENT PILOT FLIGHT 2 Credit Hours**

Comprehensive flight course for the professional pilot candidate to meet the requirements of the FAA instrument rating. This course may be repeated only once. Student is required to spend a minimum of two hours daily, five days a week, at the airport until all course requirements have been attained. When not flying, the student goes through personalized ground instruction. Special course fees apply. Please visit [www.kent.edu](http://www.kent.edu) for a list of fees.

**Prerequisite:** AERN 25743 with minimum C grade; and minimum 2.500 overall GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Corequisite:** AERN 35644.

**Schedule Type:** Flight Training

**Contact Hours:** 2 lecture

**Grade Mode:** Standard Letter-IP

**AERN 35646 INSTRUMENT HELICOPTER FLIGHT 2 Credit Hours**

Flight course designed to fulfill FAA requirements for the Instrument Helicopter Rating.

**Prerequisite:** AERN 15742 or 15743; and minimum cumulative 2.500 GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Corequisite:** AERN 35644.

**Schedule Type:** Flight Training

**Contact Hours:** 4.86 other

**Grade Mode:** Standard Letter-IP

**AERN 35647 COMMERCIAL PILOT FLIGHT II 2 Credit Hours**

Comprehensive flight course for the professional pilot candidate once. Student is required to spend a minimum of two hours each day, four days a week, at the airport until course requirements have been attained. Special course fees may apply. When not flying, the student goes through personalized ground instruction. Special course fees apply. Please visit [www.kent.edu](http://www.kent.edu) for a list of fees.

**Prerequisite:** AERN 35644 minimum C grade; and AERN 35645; and minimum 2.500 overall GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Schedule Type:** Flight Training

**Contact Hours:** 2 lecture

**Grade Mode:** Standard Letter-IP

**AERN 35648 INSTRUMENT HELICOPTER FLIGHT ADD-ON 1 Credit Hour**

Flight course designed to fulfill FAA requirements for the Instrument Helicopter Rating. This course may only be repeatable twice. Student is required to spend 1.5 hours each day, five days a week, at the airport, until the FAA minimum requirements are attained. When not flying, the student goes through personalized ground instruction with an assigned flight instructor. Minimum FAA flight time requirements towards the Instrument Helicopter Flight Rating is 15 hours of actual or simulated instrument time. Actual flight training may exceed 15 hours.

**Prerequisite:** AERN 35645; and cumulative 2.500 GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Corequisite:** AERN 35101.

**Schedule Type:** Flight Training

**Contact Hours:** 2.43 other

**Grade Mode:** Standard Letter-IP

**AERN 35650 NON-PILOT INSTRUMENT FLIGHT THEORY 3 Credit Hours**

Course instruction for instrument flight to include: navigation facilities and equipment (both ground and aircraft), general weather theory and weather related to instrument meteorological conditions, weather charts and sources, FAA regulations pertinent to the conduct of instrument flight, aeronautical charts for instrument flight and techniques and procedures unique to the conduct of instrument flight. This course does not satisfy the Federal Aviation Regulation requirement for endorsement to take the Airman Knowledge Exam for an Instrument Rating nor does it satisfy the Aircraft Dispatch minor.

**Prerequisite:** AERN 15740 or AERN 15745; and AERN 25250.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter



**AERN 35746 COMMERCIAL PILOT THEORY 2 Credit Hours**

Comprehensive instruction covering all areas necessary to exercise the privileges of a commercial pilot.

**Prerequisite:** AERN 35644.

**Corequisite:** AERN 35747.

**Schedule Type:** Flight Training

**Contact Hours:** 2 lecture

**Grade Mode:** Standard Letter

**AERN 35747 COMMERCIAL PILOT FLIGHT III 2 Credit Hours**

Comprehensive flight course for the professional pilot candidate to meet the requirements of the FAA commercial pilot certificate. With special permission, this course may be repeated only once. Student is required to spend up to two hours daily, four days a week, at the airport until the course requirements been attained. When not flying, the student goes through personalized ground instruction. Special course fees apply. Please visit [www.kent.edu](http://www.kent.edu) for a list of fees.

**Prerequisite:** AERN 35644 with a minimum C grade; and AERN 35645; and minimum 2.500 overall GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Pre/corequisite:** AERN 35647.

**Corequisite:** AERN 35746.

**Schedule Type:** Flight Training

**Contact Hours:** 2 other

**Grade Mode:** Standard Letter-IP

**AERN 35748 COMMERCIAL PILOT HELICOPTER FLIGHT ADD-ON 2 Credit Hours**

Flight course designed to fulfill Federal Aviation Administration (FAA) requirements for the commercial pilot helicopter certificate. This course may only be repeatable twice. Student is required to spend 1.5 hours each day, five days a week, at the airport, until the FAA minimum requirements are attained. When not flying, the student goes through personalized ground instruction with an assigned flight instructor. Minimum FAA flight time requirements towards the Commercial Pilot Helicopter Add-On Flight Certificate is 35 hours. Actual flight training may exceed 35 hours.

**Prerequisite:** AERN 35747; and AERN 15742 or AERN 15743; and cumulative 2.500 GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Corequisite:** AERN 35101.

**Schedule Type:** Combined Lecture and Lab

**Contact Hours:** 4.86 other

**Grade Mode:** Standard Letter-IP

**AERN 35749 COMMERCIAL PILOT HELICOPTER FLIGHT 3 Credit Hours**

Flight course designed to fulfill FAA requirements for the Commercial Pilot Helicopter certificate. This course may only be repeatable twice. Student is required to spend 1.5 hours each day, five days a week, at the airport, until the FAA minimum requirements are attained. When not flying, the student goes through personalized ground instruction with an assigned flight instructor. Minimum FAA flight time requirements towards the Commercial Pilot Helicopter Flight Certificate is 150 hours. Actual flight training may exceed 150 hours.

**Prerequisite:** AERN 15742 or 15743; and minimum cumulative 2.500 GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Corequisite:** AERN 35746.

**Schedule Type:** Flight Training

**Contact Hours:** 5.5 other

**Grade Mode:** Standard Letter-IP

**AERN 35810 UNMANNED AIRCRAFT SYSTEMS 3 Credit Hours**

Provides an understanding of the theory of operation, architecture, and performance characteristics of various airborne-onboard systems and subsystems utilized in unmanned aerial vehicles. Also includes examination of aircraft materials, structural components, and configuration.

**Prerequisite:** AERN 25800.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35830 UNMANNED AIRCRAFT SYSTEMS SENSING AND SENSOR SYSTEMS 3 Credit Hours**

An in-depth study of sensors and remote sensing systems used to support Unmanned Aircraft operations. Course emphasizes the theory, technical characteristics, capabilities, and operational use of various sensors and sensing systems. Course also investigates sensor data generation and sensing system image interpretation and analysis.

**Prerequisite:** AERN 25800.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 35840 UNMANNED AIRCRAFT SYSTEMS COMMAND, CONTROL AND COMMUNICATIONS 3 Credit Hours**

Explores the technological and operational aspects of ground-based and airborne command, control, and communications systems used in unmanned aircraft systems. Topics include UAV sense-and-avoid systems, data link systems, voice communications systems, telemetry systems, navigation systems, and manual and automatic flight control systems.

**Prerequisite:** AERN 35644 or AERN 35650; and AERN 35810.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 45010 AIRCRAFT DISPATCH I 3 Credit Hours**

This is the first of two courses required to qualify for the FAA Aircraft Dispatcher Airman Knowledge Test and the associated FAA Practical Exam for issuance of an Aircraft Dispatcher License. Topics include weather theory and weather services, regulations, aircraft systems, dispatch operations, decision making, human error, situational awareness, communications and aeronautical charts. Special course fees apply.

**Prerequisite:** AERN 35644 or AERN 35650.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 45020 AIRCRAFT DISPATCH II 3 Credit Hours**

Second of two courses designated for the practical application of previously acquired knowledge necessary to perform aircraft dispatcher functions. Topics as applied to dispatch functions include briefing techniques, preflight, weather analysis and flight planning. Required for an endorsement to take the FAA aircraft dispatcher practical test. Special course fees may apply. Please visit [www.kent.edu/caest/flight-technology](http://www.kent.edu/caest/flight-technology) and click on the Flight Course Fees link for more information.

**Prerequisite:** AERN 45010.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 45025 DISPATCH LABORATORY 1 Credit Hour**  
Practical Aircraft Dispatch application and preparation for the ADX written, oral and practical exam.

**Prerequisite:** AERN 45010.

**Corequisite:** AERN 45020.

**Schedule Type:** Laboratory

**Contact Hours:** 2 lab

**Grade Mode:** Standard Letter

**AERN 45030 AIRCRAFT SYSTEMS II 3 Credit Hours**  
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.

**Prerequisite:** AERN 35040.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 45040 LABOR RELATIONS IN THE AVIATION INDUSTRY 3 Credit Hours**

Legislation governing labor relations in the private sector of the United States Economy consist of two separate and distinct pieces of legislation: the Railway Labor Act and the National Labor Relations Act. This course focuses on the examination of air transport labor relations in the context of these key laws. As the student of aviation management comes in contact with both Acts though this course, the student will learn similarities and differences of each and their resultant impact. The student will actively apply this knowledge in a mock labor relations negotiation.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 45092 AERONAUTICAL INTERNSHIP/COOPERATIVE EDUCATION (ELR) 1-3 Credit Hours**

(Repeatable for a total of 6 hours) Work experience in aerospace/aviation industry or related activity, laboratory or student professional organization.

**Prerequisite:** Special approval.

**Schedule Type:** Practicum or Internship

**Contact Hours:** 1-3 other

**Grade Mode:** Standard Letter-IP

**Attributes:** Experiential Learning Requirement

**AERN 45096 INDIVIDUAL INVESTIGATION IN AERONAUTICS 1-3 Credit Hours**

(Repeatable for a maximum of 6 credit hours) Work study of an individual nature on a topic relating to professional aviation.

**Prerequisite:** Sophomore standing and special approval.

**Schedule Type:** Individual Investigation

**Contact Hours:** 1-3 other

**Grade Mode:** Standard Letter-IP

**AERN 45099 AERONAUTICAL STUDIES CAPSTONE (ELR) 3 Credit Hours**

(Repeatable for credit) An in-depth study of the student's area of focus within aeronautical studies, culminating to a senior level project. At the discretion of the aeronautics faculty, students may substitute another capstone course for this course. Students must pass this capstone with a grade of C (2.000) or better in order to graduate.

**Prerequisite:** Senior standing.

**Schedule Type:** Senior Project/Honors Thesis

**Contact Hours:** 3 other

**Grade Mode:** Standard Letter-IP

**Attributes:** Experiential Learning Requirement

**AERN 45100 OPERATIONAL PLANNING IN AVIATION 3 Credit Hours**

Focus on both airport and airline operations through planning, design and management. Students function as project managers and work with simulation to run their own airport design and airline operations with respect to financial and economic variables.

**Prerequisite:** AERN 35340 and AERN 35341.

**Schedule Type:** Lecture, Research

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 45121 AEROSPACE PROPULSION FOR ENGINEERING AND ENGINEERING TECHNOLOGY 3 Credit Hours**

An in-depth study of gas turbine engines, rockets, and hypersonic propulsion systems used in aerospace applications. Includes propulsion system design and operation, and the analysis of performance characteristics.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 45130 PHYSIOLOGY AND HUMAN FACTORS OF FLIGHT 3 Credit Hours**

A study of the interaction of the human body with flight and those human factors that affect flight operations.

**Prerequisite:** none.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 45135 AVIATION SAFETY THEORY 3 Credit Hours**

(Slashed with AERN 55135) An in-depth study of aviation human safety theories and the basics of risk and safety management.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 45150 APPLIED FLIGHT DYNAMICS I 3 Credit Hours**

(Slashed with AERN 55150) 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.

**Prerequisite:** PHY 13001 or PHY 23101.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 45151 APPLIED FLIGHT DYNAMICS II 3 Credit Hours**

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.

**Prerequisite:** AERN 45150.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter-IP

**AERN 45200 STRATEGIC AVIATION MANAGEMENT (ELR) 3 Credit Hours**

Serves as the capstone course for the aviation management area of concentration in aeronautics. As such, it is designed to address evolving issues and challenges in aviation management with a particular emphasis on airlines and airports through an application of previously mastered aviation management courses. Students must pass the course with a minimum grade of "C" (2.000).

**Prerequisite:** AERN 45100; and Senior standing.

**Schedule Type:** Lecture, Research

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter-IP

**Attributes:** Experiential Learning Requirement

**AERN 45250 AVIATION LAW 3 Credit Hours**

Involves a study of the origins of Western jurisprudence, common law and aviation law as an integral part of law in the U.S. Also introduces international aviation law by lateral agreement as well as U.S. Constitutional law and its amendments as they relate to the structure and process of aviation law. Criminal and civil law as they relate to civil aviation are also addressed. Case studies are included.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 45300 AIR TRAFFIC CONTROL CAPSTONE (ELR) 3 Credit Hours**

The culminating experience for the Air Traffic Control program of study. Students will work in groups to research and present a possible solution to a current event in the world of aviation and air traffic control. Students participate in realistic simulations where students take the roles within all three areas (Tower, TRACON, En Route). These scenarios often involve all three domains simultaneously where the students must work together to successfully finish the scenario, simulating a normal controller's day.

**Prerequisite:** AERN 45343 and AERN 45344; and Aeronautics (AERN) major.

**Schedule Type:** Combined Lecture and Lab

**Contact Hours:** 2 lecture, 2 lab

**Grade Mode:** Standard Letter

**Attributes:** Experiential Learning Requirement

**AERN 45320 TERMINAL OPERATIONS II 2 Credit Hours**

Advanced terminal course that focuses on the TRACON environment. Emphasis in vectoring and sequencing for approach at the primary airport. Topics covered will include, but not be limited to phraseology, maps, LOAs, and airspace.

**Prerequisite:** AERN 35342 and AERN 35345; and Aeronautics (AERN) major.

**Corequisite:** AERN 45321.

**Schedule Type:** Lecture

**Contact Hours:** 2 lecture

**Grade Mode:** Standard Letter

**AERN 45321 TERMINAL OPERATIONS II LABORATORY 1 Credit Hour**

Application of terminal air traffic control operating principles explored in AERN 45320 Terminal Operations II.

**Prerequisite:** AERN 35342 and AERN 35345; and Aeronautics (AERN) major.

**Corequisite:** AERN 45320.

**Schedule Type:** Laboratory

**Contact Hours:** 2 lab

**Grade Mode:** Standard Letter

**AERN 45340 AIRCRAFT MAINTENANCE 3 Credit Hours**

Fundamentals of aircraft maintenance and resolving maintenance problems on the flight line.

**Prerequisite:** Aeronautics (AERN) major and Senior standing and special approval.

**Schedule Type:** Combined Lecture and Lab

**Contact Hours:** 3 other

**Grade Mode:** Standard Letter

**AERN 45343 EN ROUTE II 2 Credit Hours**

Advanced en route course that focuses on low altitude, en route operations. Some time is spent on high altitude and special operations as well. Topics covered include, but not limited to phraseology, procedures, LOAs and maps.

**Prerequisite:** AERN 45320 and AERN 45321; and Aeronautics (AERN) major.

**Corequisite:** AERN 45344.

**Schedule Type:** Lecture

**Contact Hours:** 2 lecture

**Grade Mode:** Standard Letter

**AERN 45344 EN ROUTE II LABORATORY 1 Credit Hour**

Application of en route air traffic control operating principles explored in AERN 45343 En Route II.

**Prerequisite:** Aeronautics (AERN) major.

**Corequisite:** AERN 45343.

**Schedule Type:** Laboratory

**Contact Hours:** 2 lab

**Grade Mode:** Standard Letter

**AERN 45349 SYSTEMS MAINTENANCE AND RELIABILITY 5 Credit Hours**

Combines theories of systems and operations with practical experience to meet FAA standards for an airframe and powerplant license (300 hours shop experience).

**Prerequisite:** AERN 45340.

**Schedule Type:** Lecture

**Contact Hours:** 5 lecture

**Grade Mode:** Standard Letter

**AERN 45350 AVIONICS 3 Credit Hours**

(Slashed with AERN 55350) A study of aviation electronic systems in flight vehicles that pertain to communication, navigation and air traffic control systems.

**Prerequisite:** PHY 13001 and PHY 13012.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter



**AERN 45360 PROFESSIONAL DEVELOPMENT IN AERONAUTICS III 1 Credit Hour**

Seminar on selected topics relating to problems, issues and conditions of employment within aviation. Prerequisite: AERN 30000; and Senior standing

**Schedule Type:** Lecture

**Contact Hours:** 1 lecture

**Grade Mode:** Standard Letter

**AERN 45600 AIRCRAFT STABILITY AND CONTROL 3 Credit Hours**

Three-dimensional rigid body dynamics, aircraft equations of motion, principles of static stability and control, dynamic stability of uncontrolled motion, gyroscopic instruments. Corerequisite: AERN 45601.

**Prerequisite:** AERN 25500 and AERN 35400.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 45601 AIRCRAFT STABILITY AND CONTROL LABORATORY 1 Credit Hour**

Laboratory demonstrations and experiments for various aspects of aircraft stability and control.

**Prerequisite:** None.

**Corequisite:** AERN 45600.

**Schedule Type:** Laboratory

**Contact Hours:** 2 lab

**Grade Mode:** Standard Letter

**AERN 45648 THEORY OF FLIGHT INSTRUCTION (ELR) 3 Credit Hours**

Detailed fundamentals of teaching flight and ground instruction and the analysis of flight techniques, in order to meet requirements of FAR's part 61.185(a).

**Prerequisite:** AERN 35040, 35746, 35747 and 45150.

**Corequisite:** AERN 45649.

**Schedule Type:** Flight Training

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**Attributes:** Experiential Learning Requirement

**AERN 45649 FLIGHT INSTRUCTOR/AIRPLANES 2 Credit Hours**

Flight course with emphasis on instructing techniques in aircraft from right seat. Includes student evaluation techniques to meet Federal Aviation Regulation for certified flight instructor. With special approval, this course may be repeated only once. Student is required to spend a minimum of two hours daily, five days a week, at the airport until course requirements have been attained. When not flying, the student goes through personalized ground instruction. Special course fees apply. Please visit [www.kent.edu](http://www.kent.edu) for a list of fees.

**Prerequisite:** AERN 35746 with a minimum C grade; and AERN 35747; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Corequisite:** AERN 45648.

**Schedule Type:** Flight Training

**Contact Hours:** 9 other

**Grade Mode:** Standard Letter-IP

**AERN 45650 CERTIFIED FLIGHT INSTRUCTOR HELICOPTER FLIGHT 2 Credit Hours**

Flight course designed to fulfill FAA requirements for the Flight Instructor Helicopter certificate.

**Prerequisite:** AERN 35746 and 35749; and 2.500 cumulative GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Corequisite:** AERN 45648.

**Schedule Type:** Flight Training

**Contact Hours:** 2.22 other

**Grade Mode:** Standard Letter-IP

**AERN 45651 FLIGHT INSTRUCTOR-INSTRUMENTS 2 Credit Hours**

Flight course with emphasis on flight instructing techniques involved with instrument flight and air traffic control procedures. With special approval this course may be repeated only once. Student is required to spend a minimum of two hours daily, three days a week, at the airport until course requirements have been met. When not flying, the student goes through personalized ground instruction. Special course fees apply. Please visit [www.kent.edu](http://www.kent.edu) for more information.

**Prerequisite:** AERN 45648 with a minimum C grade; and AERN 45649; and minimum 2.500 overall GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Schedule Type:** Flight Training

**Contact Hours:** 2 lecture, 9 other

**Grade Mode:** Standard Letter-IP

**AERN 45652 CERTIFIED FLIGHT INSTRUCTOR INSTRUMENT HELICOPTER FLIGHT 1 Credit Hour**

Flight course designed to fulfill FAA requirements for the Flight Instructor Instrument Helicopter certificate. This course may only be repeated twice. Student is required to spend 1.5 hours each day, five days a week, at the airport, until the course requirements are attained. When not flying, the student goes through personalized ground instruction with an assigned flight instructor. Certified Flight Instructor Helicopter Certificate is 15 hours. Actual flight training may exceed 15 hours.

**Prerequisite:** AERN 35646 or 35648; and AERN 45650 or 45659; and 2.500 cumulative GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Schedule Type:** Flight Training

**Contact Hours:** 1.1 other

**Grade Mode:** Standard Letter-IP

**AERN 45653 MULTI-ENGINE PILOT FLIGHT 1 Credit Hour**

Course provides the required ground and flight instruction necessary to qualify students for the multi-engine rating from the FAA. With special approval this course may be repeated only once. Student is required to spend a minimum of two hours daily, three days a week, at the airport until course requirements have been attained. When not flying, the student goes through personalized ground instruction. Special course fees apply. Please visit [www.kent.edu](http://www.kent.edu) for more information.

**Prerequisite:** AERN 35747; and minimum 2.500 overall GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Schedule Type:** Flight Training

**Contact Hours:** 1 lecture, 9 other

**Grade Mode:** Standard Letter-IP

**AERN 45654 CERTIFIED FLIGHT INSTRUCTOR HELICOPTER FLIGHT ADD-ON 1 Credit Hour**

Flight course designed to fulfill FAA requirements for the Flight Instructor Helicopter Add-on certificate.

**Prerequisite:** AERN 45649; and 2.500 cumulative GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Schedule Type:** Flight Training

**Contact Hours:** 1.1 other

**Grade Mode:** Standard Letter-IP

**AERN 45655 ADVANCED MULTI-ENGINE PILOT FLIGHT 1 Credit Hour**

Ground flight instruction for proficiency and required hours in preparation for multi-engine instruction. Special course fees may apply. Please visit [www.kent.edu/caest/flight-technology](http://www.kent.edu/caest/flight-technology) and click on the Flight Course Fees link for more information.

**Prerequisite:** AERN 45653; and minimum 2.500 overall GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Schedule Type:** Flight Training

**Contact Hours:** 9 other

**Grade Mode:** Standard Letter-IP

**AERN 45656 CERTIFIED FLIGHT INSTRUCTOR INSTRUMENT HELICOPTER FLIGHT ADD ON 1 Credit Hour**

Flight course designed to fulfill FAA requirements for the Flight Instructor Instrument Helicopter Add-on certificate.

**Prerequisite:** AERN 45651; and cumulative 2.500 GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Schedule Type:** Flight Training

**Contact Hours:** 1.1 other

**Grade Mode:** Standard Letter-IP

**AERN 45657 MULTI-ENGINE FLIGHT INSTRUCTOR 1 Credit Hour**

Course provides the necessary ground and flight instruction to professionally qualify students for the multi-engine instructor rating by the FAA. This course may be repeated only twice. Student is required to spend two hours daily, three days a week, at the airport. When not flying, the student goes through personalized ground instruction with the flight instructor. Special course fees may apply. Please visit [www.kent.edu/caest/flight-technology](http://www.kent.edu/caest/flight-technology) and click on the Flight Course Fees link for more information.

**Prerequisite:** AERN 45649 and AERN 45655; and minimum 2.500 overall GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Schedule Type:** Flight Training

**Contact Hours:** 9 other

**Grade Mode:** Standard Letter-IP

**AERN 45659 UPSET RECOVERY TRAINING 1 Credit Hour**

Consisting of both ground school and hands-on flight components, this upset training course prepares pilots for emergency situations they may encounter that cannot properly be replicated in a typical GA aircraft.

Extensive piston driven and swept wing jet aerodynamic characteristics, accident analysis and recovery profile. Special course fees may apply. Please visit [www.kent.edu/caest/flight-technology](http://www.kent.edu/caest/flight-technology) and click on the Flight Course Fees link for more information.

**Prerequisite:** AERN 15741; and minimum 2.500 overall GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics (AERN) major.

**Schedule Type:** Flight Training

**Contact Hours:** 9 other

**Grade Mode:** Standard Letter

**AERN 45700 AIRCRAFT DESIGN (ELR) 3 Credit Hours**

(Slashed with AERN 55700) First 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 introduction to design, decision-making in design and preliminary sizing of an aerospace vehicle to meet customer requirements. Final technical report and presentation.

**Prerequisite:** (AERN 45030 and AERN 45150 and AERN 45121) or (AERN 35300 and AERN 35500 and AERN 45121).

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**Attributes:** Experiential Learning Requirement

**AERN 45710 TURBINE ENGINE THEORY AND OPERATION 2 Credit Hours**

An in-depth study of the theory, operation and performance of turbine turboprop engines and associated systems.

**Prerequisite:** AERN 35020.

**Schedule Type:** Lecture

**Contact Hours:** 2 lecture

**Grade Mode:** Standard Letter

**AERN 45711 TURBINE ENGINE THEORY AND OPERATION LABORATORY 1 Credit Hour**

Laboratory using a turboprop flight simulator to provide instruction and demonstration of the operating characteristics and procedures associated with turbine/turboprop engines. Special course fees may apply. Please visit [www.kent.edu/caest/flight-technology](http://www.kent.edu/caest/flight-technology) and click on the Flight Course Fees link for more information.

**Prerequisite:** AERN 35020; and Aeronautics (AERN) major.

**Pre/corequisite:** AERN 45710.

**Schedule Type:** Private Lesson

**Contact Hours:** 1 other

**Grade Mode:** Standard Letter

**AERN 45720 CREW RESOURCE MANAGEMENT 2 Credit Hours**

An in-depth study of the common principles of aviation crew resource management (CRM) and human factors as utilized by air transport flight crews.

**Prerequisite:** AERN 45130.

**Schedule Type:** Lecture

**Contact Hours:** 2 lecture

**Grade Mode:** Standard Letter-IP

**AERN 45721 CREW RESOURCE MANAGEMENT LABORATORY 1 Credit Hour**

Flight simulator-based laboratory that includes flight simulator experiences that integrate crew resource management (CRM) and line-oriented flight training (LOFT) in a multicrew environment. Special course fees may apply. Please visit [www.kent.edu/caest/flight-technology](http://www.kent.edu/caest/flight-technology) and click on the Flight Course Fees link for more information.

**Prerequisite:** AERN 45130.

**Pre/corequisite:** AERN 45720.

**Schedule Type:** Combined Lecture and Lab

**Contact Hours:** 1 other

**Grade Mode:** Standard Letter-IP

**AERN 45730 APPLIED TRANSPORT CATEGORY AIRCRAFT SYSTEMS 3 Credit Hours**

Course examines various systems in use on air transport aircraft. The course emphasis is on the principles, operation and limitations of complex, integrated systems found in modern aircraft.

**Prerequisite:** AERN 35020 and AERN 45030.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 45740 FLIGHT MANAGEMENT SYSTEMS 3 Credit Hours**

Course examines various advanced avionics systems used on air transport type aircraft. The course emphasis is on the principles, operation and limitations of integrated avionics related to the "glass cockpit" found on modern aircraft.

**Prerequisite:** AERN 45030 and 45350.

**Schedule Type:** Combined Lecture and Lab

**Contact Hours:** 3 other

**Grade Mode:** Standard Letter

**AERN 45791 AVIATION SECURITY AND POLICY SEMINAR (WIC) 3 Credit Hours**

(Slashed with AERN 55791) Examines policies, practices, procedures and regulatory provisions developed to create and enhance security in civil aviation with a special emphasis on airlines, airports, airspace and agencies responsible for civil aviation security.

**Prerequisite:** AERN 45250.

**Schedule Type:** Seminar

**Contact Hours:** 3 other

**Grade Mode:** Standard Letter

**Attributes:** Writing Intensive Course

**AERN 45800 UNMANNED AIRCRAFT SYSTEMS FLIGHT OPERATIONS THEORY 4 Credit Hours**

Classroom instruction to provide the general information and knowledge necessary to prepare students to pilot and operate unmanned aircraft. Emphasis is placed on the acquisition of knowledge required to engage in UAS flight operations, specifically focused on piloting UAVs and managing UAV sensors. This course provides students with the background knowledge required to begin flight training and to perform real-time mission management operations for high performance unmanned aircraft systems.

**Prerequisite:** AERN 25350; and AERN 25351; and AERN 35644 or AERN 35650; and AERN 35830; and AERN 35840; and AERN 45150.

**Schedule Type:** Lecture

**Contact Hours:** 4 lecture

**Grade Mode:** Standard Letter

**AERN 45850 AIRCRAFT DESIGN II (WIC) 3 Credit Hours**

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.

**Prerequisite:** AERN 45600 and AERN 45700.

**Corequisite:** AERN 45900.

**Schedule Type:** Laboratory, Lecture, Combined Lecture and Lab

**Contact Hours:** 2 lecture, 2 lab

**Grade Mode:** Standard Letter

**Attributes:** Writing Intensive Course

**AERN 45900 AEROELASTICITY 3 Credit Hours**

Review of beam analysis. Structural dynamics of one-dimensional systems. Analysis of static aeroelastic phenomena, unsteady aerodynamics and flutter. Equations of motion for complete aeroelastic systems; solution techniques.

**Prerequisite:** AERN 35150 and TECH 33111.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 55135 AVIATION SAFETY THEORY 3 Credit Hours**

(Slashed with AERN 45135) An in-depth study of aviation human safety theories and the basics of risk and safety management.

**Prerequisite:** Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 55150 APPLIED FLIGHT DYNAMICS I 3 Credit Hours**

(Slashed with AERN 45150) A course relating aircraft, engine and propeller performance to the overall flight performance of the typical light airplane. Includes flight test project participation.

**Prerequisite:** AERN 15000; and MATH 11012 or MATH 12002; and PHY 13001 and PHY 13002 (or PHY 23101 and 23102); and graduate standing.

**Schedule Type:** Combined Lecture and Lab

**Contact Hours:** 3 other

**Grade Mode:** Standard Letter

**AERN 55235 HUMAN ERROR ANALYSIS IN AVIATION 3 Credit Hours**

Provides an in-depth look at human error and its implications in the realm of safety using examples from the aviation industry. Includes a basic overview of human error, discussion on the models available to examine error, provides knowledge on how to classify and provide recommendations of intervention strategies. A focus will be on the SHELL Model, the Human Factors Analysis and Classification System, and the 5M model. This course will use real examples of accidents and incidents for students to apply these strategies.

**Prerequisite:** Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 55350 AVIONICS 3 Credit Hours**

(Slashed with AERN 45350) A descriptive course that covers electronic systems in aviation, particularly from the standpoint of aircraft equipment its operational theory and practical use by the pilot.

**Prerequisite:** AERN 15000; and PHY 13001 and PHY 13002 (or PHY 23101 and 23102); and TECH 21021; and graduate standing.

**Schedule Type:** Combined Lecture and Lab

**Contact Hours:** 3 other

**Grade Mode:** Standard Letter

**AERN 55700 AIRCRAFT DESIGN 3 Credit Hours**

(Slashed with AERN 45700) First 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 introduction to design, decision-making in design and preliminary sizing of an aerospace vehicle to meet customer requirements. Final technical report and presentation.

**Prerequisite:** graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 55791 AVIATION SECURITY AND POLICY SEMINAR 3 Credit Hours**

(Repeatable for credit) (Slashed with AERN 45791) Examines policies, practices, procedures and regulatory provisions developed to create and enhance security in civil aviation with a special emphasis on airlines, airports, airspace and agencies responsible for civil aviation security.

**Prerequisite:** Graduate standing.

**Schedule Type:** Seminar

**Contact Hours:** 3 other

**Grade Mode:** Standard Letter

**AERN 61091 AEROSPACE SEMINAR 1 Credit Hour**

(Repeatable for a maximum of three semesters) Discussions of selected technical topics related to aerospace technology.

**Prerequisite:** Graduate standing.

**Schedule Type:** Seminar

**Contact Hours:** 1 other

**Grade Mode:** Standard Letter

**AERN 65095 SPECIAL TOPICS IN AERONAUTICS 1-4 Credit Hours**

(Repeatable for a maximum of 15 credit hours) Study of special topics that focus on subjects and issues in aeronautics.

**Prerequisite:** Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 1-4 lecture

**Grade Mode:** Standard Letter

**AERN 65240 AVIATION SAFETY MANAGEMENT SYSTEMS 3 Credit Hours**

An in-depth study of the concepts and principles of aviation safety management and aviation Safety Management Systems (SMS). Provides a fundamental knowledge of SMS safety policy, safety risk management, safety assurance, and safety promotion. Also includes a thorough analysis of the design, implementation, and management of Safety Management Systems and its incorporation into various aviation sectors.

**Prerequisite:** Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 65300 AIRLINE TRANSPORTATION OPERATIONS 3 Credit Hours**

The study of scheduled and charter airline transport operations under Federal Air Regulations (FAR) Part 135.

**Prerequisite:** Special approval and Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**AERN 65496 INDIVIDUAL INVESTIGATION IN AERONAUTICS 1-4 Credit Hours**

(Repeatable for a maximum of 9 credit hours) Individual investigation of various aeronautics-related topics.

**Prerequisite:** Special approval and graduate standing.

**Schedule Type:** Individual Investigation

**Contact Hours:** 1-4 other

**Grade Mode:** Standard Letter-IP