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.
Corequisite: MATH 12002.
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
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. 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. 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. Special course fees apply. Please visit www.kent.edu. Students must obtain Student Pilot Certificate and have and maintain valid medical and TSA approval prior to starting course.
Prerequisite: AERN 15740 and 15741; and minimum 2.500 overall GPA; 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 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    3 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: 3 lecture
Grade Mode: Standard Letter

AERN 25210  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 25250  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 25251  WEATHER INFORMATION SYSTEMS    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 private pilot nor does it satisfy the Aircraft Dispatch minor.
Prerequisite: None.
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 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 purposes and directives of the air traffic control environment. To include purposes and responsibilities of the ATC system.
Prerequisite: Aeronautics 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 or MATH 32051.
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.caee 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 and MATH 11010.

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 propulsion 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 AIRCRAFTS 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 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 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: None.
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 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 major.
Schedule Type: Lecture
Contact Hours: 3 lecture
Grade Mode: Standard Letter

AERN 35344 TERMINAL OPERATIONS I LABORATORY 1 Credit Hour
Application of terminal air traffic control operating principles explored in
AERN 35342 Terminal Operations I.
Prerequisite: AERN 25350 and AERN 25351; and AERN 15740 or
AERN 15745; and Aeronautics 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: MATH 32044 or MATH 32052; and minimum C grade in
AERN 25400.
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 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 for a list of fees.
Prerequisite: Minimum C grade in AERN 25743; and minimum 2.500 overall GPA; and must be in the Flight Technology (FLGT) concentration in the Aeronautics 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 2.500 overall GPA; and must be in the Flight Technology concentration in the Aeronautics 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 for a list of fees.
Prerequisite: Minimum C grade in AERN 35644; and AERN 35645; and minimum 2.500 overall GPA; and must be in the Flight Technology concentration in the Aeronautics major.
Corequisite: AERN 35746.
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 2.500 overall GPA; and must be in the Flight Technology concentration in the Aeronautics 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 35647.
Schedule Type: Lecture
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 have been attained. When not flying, the student goes through personalized ground instruction. Special course fees apply. Please visit www.kent.edu for a list of fees.
Prerequisite: Minimum C grade in AERN 35647; and minimum 2.500 overall GPA; and must be in the Flight Technology concentration in the Aeronautics major.
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 each 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 2.500 overall GPA; and must be in the Flight Technology concentration in the Aeronautics 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 AERN 15743; and minimum 2.500 overall GPA; and must be in the Flight Technology concentration in the Aeronautics 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 45001  INITIAL DISPATCH I  2 Credit Hours
Part I of III preliminary courses required for students not currently enrolled at Kent State University. Provided in order to meet Federal Aviation Regulation requirements under Part 65 for training to become an Aircraft Dispatcher. This course may be necessary as preliminary training to enroll in AERN 45010 and 45020 Aircraft Dispatch I and II respectively. Successful completion of Dispatch I and II results in authorization to take the FAA written and practical exams for the Aircraft Dispatcher Certificate. Need for the course depends on previous coursework or FAA certificates completed.
Prerequisite: Special approval.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter
AERN 45002 INITIAL DISPATCH II 2 Credit Hours
Part II of III preliminary courses required for students not currently enrolled at Kent State University to enroll in Aircraft Dispatch I or Aircraft Dispatch II. This course is a continuation of training required by Part 65 of the Federal Aviation Regulations to earn an Aircraft Dispatcher Certificate. It may be required in order to meet the registration requirements for AERN 45010 and 45020, Aircraft Dispatch I and II of which successful completion results in authorization to take the FAA written and practical exams for the Aircraft Dispatcher Certificate. Need for the course depends on previous coursework or FAA certificates completed.
Prerequisite: Special approval.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter

AERN 45003 INITIAL DISPATCH III 2 Credit Hours
Part III of III preliminary courses required for students not currently enrolled at Kent State University to enroll in Aircraft Dispatch I or Aircraft Dispatch II. This course is the final course to complete preliminary training required by Part 65 of the Federal Aviation Regulations to earn an Aircraft Dispatcher Certificate. It may be required in order to meet the registration requirements for AERN 45010 and 45020, Aircraft Dispatch I and II respectively, of which successful completion results in authorization to take the FAA written and practical exams for the Aircraft Dispatcher Certificate. Need for the course depends on previous coursework or FAA certificates completed.
Prerequisite: Special approval.
Schedule Type: Lecture
Contact Hours: 2 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 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  AIRPORT OPERATIONS  3 Credit Hours
This course focuses on the daily functions of Airport Operations. Students receive hands-on training in performing daily inspections at the Kent State Airport to evaluate and keep track of airfield discrepancies. Students will use a database to address the Airport Certification Manual and FAR Part 139 criteria.
Prerequisite: AERN 35340.
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 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 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 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 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 major; and Senior standing; and special approval.
Schedule Type: Combined Lecture and Lab
Contact Hours: 2 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 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 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.
Prerequisite: Minimum C grade in AERN 25500 and AERN 35400.
Corequisite: AERN 45601.
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, AERN 35746, AERN 35747 and AERN 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 for a list of fees.
Prerequisite: AERN 35747; and minimum C grade in AERN 35746; and must be in the Flight Technology concentration in the Aeronautics 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 AERN 35749; and 2.500 overall GPA; and must be in the Flight Technology concentration in the Aeronautics 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 for more information.
Prerequisite: AERN 45649; and AERN 45648 with a minimum C grade; and minimum 2.500 overall GPA; and must be in the Flight Technology concentration in the Aeronautics 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 AERN 35648; and AERN 45650 or AERN 45659; and 2.500 overall GPA; and must be in the Flight Technology concentration in the Aeronautics 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 for more information.
Prerequisite: AERN 35747; and minimum 2.500 overall GPA; and must be in the Flight Technology concentration in the Aeronautics 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 overall GPA; and must be in the Flight Technology concentration in the Aeronautics 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 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 concentration in the Aeronautics 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 2.500 overall GPA; and must be in the Flight Technology concentration in the Aeronautics 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 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 concentration in the Aeronautics major.
Schedule Type: Flight Training
Contact Hours: 9 other
Grade Mode: Standard Letter-IP

AERN 45658  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 profiles. Special course fees may apply. Please visit 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 concentration in the Aeronautics 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 and click on the Flight Course Fees link for more information.
Prerequisite: AERN 35020; and Aeronautics 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 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.
Corequisite: 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 AERN 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

Aeronautics (AERN)
AERN 55100 APPLIED FLIGHT DYNAMICS I 3 Credit Hours
(Slashed with AERN 45150) 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: AERN 15000; and MATH 11012 or MATH 12002; and PHY 13001 and PHY 13002 (or PHY 23101 and PHY 23102); and graduate standing.
Schedule Type: Combined Lecture and Lab
Contact Hours: 3 other
Grade Mode: Standard Letter

AERN 55350 AVIONICS 3 Credit Hours
(Slashed with AERN 45350) 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; and graduate standing.
Schedule Type: Combined Lecture and Lab
Contact Hours: 3 lecture
Grade Mode: Standard Letter

AERN 55790 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
(Repealable 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 65091 SEMINAR IN EMERGING ISSUES IN AVIATION LOGISTICS 2 Credit Hours
Guided by issues set forth by the International Air Cargo Association the Cargo Airlines Association, this variable content seminar will provide an interactive, dynamic and in-depth discussion on topics of immediate concern for the air freight industry.
Prerequisite: AERN 65100; and graduate standing.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter

AERN 65092 PRACTICUM IN AERONAUTICS 1 Credit Hour
(Repeatable for credit) Up to 6 total credit hours of practicum to gain experience in the aerospace or aviation industry managing various aspects of logistics. Logistic projects related to systems analysis, product or vehicle movement, legal and ethical issues, economic issues, international needs, safety, human resources and managerial assessment, or other aspects of managing logistics as approved are the focus of the course.
Prerequisite: Graduate standing; and special approval.
Schedule Type: Practicum or Internship
Contact Hours: 3 other
Grade Mode: Standard Letter-IP

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 65100 LOGISTICAL STRATEGIES IN AVIATION MANAGEMENT 2 Credit Hours
This course presents the business of aviation logistics and its role in the global supply chain by examining different product sectors using air freight. By means of both domestic and international example, it then details some of the challenges facing the air cargo industry today and presents possible management options for their resolution.
Prerequisite: Graduate standing.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter

AERN 65150 LEGAL AND REGULATORY ISSUES FOR AIR CARGO MANAGEMENT 2 Credit Hours
With a focus on both the domestic and global marketplace, this course provides in-depth coverage of the regulatory bodies and the protocols and procedures that govern the air cargo industry.
Prerequisite: AERN 65100; and graduate standing.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter

AERN 65199 THESIS I 2-6 Credit Hours
Thesis students must register for a minimum of 6 hours, 2 to 6 hours in a single semester distributed over several semesters if desired.
Prerequisite: Graduate standing; and special approval.
Schedule Type: Masters Thesis
Contact Hours: 2-6 other
Grade Mode: Satisfactory/Unsatisfactory-IP

AERN 65200 AVIATION ECONOMICS AND FISCAL MANAGEMENT 2 Credit Hours
Using examples from across key industries that make up the aviation sector, this course examines profit strategies employed by cargo-carrying airlines, all-cargo carriers, airports, ground transportation providers, and others with an aim of highlighting their role in and their impact on the business of air freight.
Prerequisite: Graduate standing.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter
AERN 65201 AVIATION INDUSTRY CONTRACT MANAGEMENT 2 Credit Hours
The course provides students with practical experience in the realm of aviation contracts.
Prerequisite: MIS 64041; and graduate standing.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter

AERN 65230 MODELING AND FORECASTING FOR AVIATION LOGISTICS PLANNING 2 Credit Hours
This course presents topics and techniques necessary to understand and develop an aviation logistics model such that an accurate and effective aviation demand forecast can be made.
Prerequisite: AERN 65100 and AERN 65200; and graduate standing.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter

AERN 65235 HUMAN ERROR ANALYSIS IN AVIATION 2 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: 2 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 65250 APPLIED HUMAN FACTORS ENGINEERING 3 Credit Hours
Survey of human factors engineering and ergonomics, emphasizing the human-centered approach to systems, product, workplace, and machine design. Discussions will include human factors research and design methodologies, human factors fundamentals (e.g., sensation and perception, information processing, anthropometry) and applications of human factors for the design of workplace and environment.
Prerequisite: Graduate standing.
Schedule Type: Lecture
Contact Hours: 3 lecture
Grade Mode: Standard Letter

AERN 65270 HUMAN FACTORS IN SYSTEMS DESIGN 3 Credit Hours
Human factors input into operator-system design, development, testing, and evaluation. Emphasis on the systems approach to human-machine-interface, with discussion and application of specific methodologies and analytical techniques. Highly focus on design of display and control systems.
Prerequisite: Graduate standing.
Pre/corequisite: AERN 65250.
Schedule Type: Lecture
Contact Hours: 3 lecture
Grade Mode: Standard Letter

AERN 65280 HUMAN INFORMATION PROCESSING 3 Credit Hours
An examination of human information reception, information processing, and skilled performance capabilities and limitations in human-matching systems with an emphasis on models and techniques including psychophysics, signal detection theory, information theory, and decision-making theory.
Prerequisite: AERN 65250; and graduate standing.
Schedule Type: Lecture
Contact Hours: 3 lecture
Grade Mode: Standard Letter

AERN 65299 THESIS II 2 Credit Hours
Thesis students must continue registration each semester until all degree requirements are met.
Prerequisite: AERN 65199; and graduate standing.
Schedule Type: Masters Thesis
Contact Hours: 2 other
Grade Mode: Satisfactory/Unsatisfactory-IP

AERN 65300 AIRLINE TRANSPORTATION OPERATIONS 3 Credit Hours
This course provides a managerial approach that highlights the importance of airline transportation. Students examine the framework for airline transportation from a micro and macro perspective. The focus is on operations management that is specialized or unique to the airline industry including regulation and public policy, as they overview operations, service and cost structure.
Prerequisite: Graduate standing.
Schedule Type: Lecture
Contact Hours: 3 lecture
Grade Mode: Standard Letter

AERN 65301 AIR CARGO SECURITY 2 Credit Hours
This course examines Post 9-11 legislation put in place with respect to air cargo security and details unique challenges facing the industry today with an eye toward management of those challenges for future growth.
Prerequisite: Graduate standing.
Schedule Type: Lecture
Contact Hours: 2 lecture
Grade Mode: Standard Letter
AERN 65400   WEATHER FOR AVIATION LOGISTICS PLANNING   2
Credit Hours
Introduction to weather concepts as related to aviation operations
management. This course focuses on the effect of various phenomena
on airport, airline, and small aircraft feeder operations. The emphasis
is on understanding conditions that produce various phenomena,
use of available weather products to determine conditions and
hazardous conditions and their likely impact on aviation operations. An
understanding of regulations relative to weather operations and aircraft
capabilities will be gained. Regional weather is discussed.
Prerequisite: Graduate standing.
Schedule Type: Lecture
Contact Hours: 2 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: Graduate standing and special approval.
Schedule Type: Individual Investigation
Contact Hours: 1-4 other
Grade Mode: Standard Letter-IP

AERN 65499   CAPSTONE IN AERONAUTICS   2 Credit Hours
The Capstone is a culminating experience that will require completion
of a comprehensive project at a workplace through employment or
internship, or, a comprehensive research paper from an investigation.
The goal is to demonstrate competence in aviation management
and logistics. Possibilities include empirical research, case studies,
theoretical or applied projects or projects for identified clients. The
student will be evaluated on the use of knowledge and skills gained from
other courses taken in the degree program.
Prerequisite: TECH 60001, TECH 60003, TECH 60078, AERN 65091,
AERN 65100, AERN 65200, AERN 65150, MIS 64005, MIS 64041 and
MIS 64042.
Schedule Type: Project or Capstone
Contact Hours: 2 other
Grade Mode: Standard Letter