

# Department of Aerospace

**Paul A. Craig, Chair**

**Business and Aerospace Building 211C**

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Programs in the Department of Aerospace lead to the Bachelor of Science degree with a major in Aerospace and concentrations in Administration, Maintenance Management, Professional Pilot, Technology, and Flight Dispatch and Scheduling. A minor in Aerospace is also available. All of these programs are designed to prepare students for professional positions in the air transportation or aerospace manufacturing industry or in operations supporting allied areas.

## Aerospace Core Requirement

All Aerospace majors will take AERO 1010, 1020, 3020, 3030, and 4040.

**Curricular listings include General Education requirements in Communication, History, Humanities and/or Fine Arts, Mathematics, Natural Sciences, and Social/Behavioral Sciences categories as outlined on pages 60–63.**

## Major in Aerospace

### Concentration: Administration

The Administration concentration offers instruction designed for students who are interested in careers in the various aspects of aerospace administration and management. Selected General Education and minor courses are interwoven with aerospace courses to provide students with a foundation for such careers. This concentration requires the completion of

1. 39 semester hours in aerospace courses as listed below;
2. a minor as recommended by the faculty advisor and approved by the department chair and dean;
3. other specific required courses as listed below.

#### Recommended Sequence and Curriculum Requirements

| FRESHMAN                    |           | SOPHOMORE                   |           |
|-----------------------------|-----------|-----------------------------|-----------|
| AERO 1010, 1020             | 6         | AERO 2010                   | 3         |
| ENGL 1010, 1020 (Comm)      | 6         | AERO 2140 or 2230           | 3         |
| MATH 1710 (Math)            | 3         | ENGL 2020 or 2030 or        |           |
| HIST 2010, 2020, or 2030    | 6         | HUM 2610 (Hum/FA)           | 3         |
| COMM 2200 (Comm)            | 3         | Humanities and/or Fine Arts | 3         |
| Humanities and/or Fine Arts | 3         | Social/Behavioral Sciences  |           |
| TRNS 1610                   | 3         | (2 prefixes)                | 6         |
|                             | <b>30</b> | CHEM 1010 (Nat Sci)         | 4         |
|                             |           | PHYS 2010/2011 (Nat Sci)    | 4         |
|                             |           | INFS 2200 or 3100           | 3         |
|                             |           | MATH 1810                   | 3         |
|                             |           |                             | <b>32</b> |

### JUNIOR

|                        |   |                        |           |
|------------------------|---|------------------------|-----------|
| AERO 3020, 3030        | 6 | AERO 4040, 4100, 4110, |           |
| MGMT 3610              | 3 | 4150                   | 12        |
| ACTG 3000              | 3 | TRNS 3630              | 3         |
| MKT 3820               | 3 | AERO or TRNS elective  | 3         |
| BMOM 3510 or ENGL 3520 | 3 | Minor                  | 9         |
| Electives              | 4 |                        | <b>27</b> |
| Minor                  | 9 |                        |           |

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### SENIOR

### Concentration: Flight Dispatch and Scheduling

The Flight Dispatch and Scheduling concentration offers instruction designed to meet the aviation industry's needs by preparing professional, corporate, and airline flight dispatchers and schedulers. Selected General Education and minor courses are interwoven with required aerospace courses to provide students with a foundation for careers in this area. This concentration requires the completion of

1. 40 hours of aerospace courses as listed below;
2. a minor of 18 semester hours to be selected from one of the following: Geography/Geology, Computer Science, Information Systems, or other science or business-related field;
3. other specific required courses as listed below.

#### Recommended Sequence and Curriculum Requirements

| FRESHMAN                 |           | SOPHOMORE                  |           |
|--------------------------|-----------|----------------------------|-----------|
| AERO 1010, 1020, 2010    | 9         | AERO 3210                  | 3         |
| ENGL 1010, 1020 (Comm)   | 6         | HIST 2010, 2020, or 2030   | 6         |
| CHEM 1010 (Nat Sci)      | 4         | ENGL 2020 or 2030 or       |           |
| PHYS 2010/2011 (Nat Sci) | 4         | HUM 2610 (Hum/FA)          | 3         |
| MATH 1710 (Math)         | 3         | Humanities and/or          |           |
| COMM 2200 (Comm)         | 3         | Fine Arts (2 prefixes)     | 6         |
| PSY 2180                 | 3         | Social/Behavioral Sciences | 3         |
|                          | <b>32</b> | MATH 1810                  | 3         |
|                          |           | GEOG 2000 or PSY 1410      |           |
|                          |           | (Soc/Beh Sci)              | 3         |
|                          |           | CSCI 1000                  | 1         |
|                          |           | Elective                   | 3         |
|                          |           |                            | <b>31</b> |

### JUNIOR

|                       |           |                        |    |
|-----------------------|-----------|------------------------|----|
| AERO 3020, 3030       | 6         | AERO 3230, 4040, 4580, |    |
| AERO 3080, 3170, 4530 | 9         | 4590                   | 12 |
| Electives             | 6         | ECON 4510 or MGMT 4510 | 3  |
| Minor                 | 9         | GEOG 3410 or GEOL 4050 | 3  |
|                       | <b>30</b> | Minor                  | 9  |

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### Concentration: Maintenance Management

The Maintenance Management concentration offers instruction designed for students who are interested in careers as skilled technicians or managers in aircraft manufacturing, aircraft repair, engine overhaul, or space vehicle maintenance. The fundamental skills needed in aerospace vehicle repair and maintenance are stressed together with management skills for such careers. MTSU is an approved Federal Aviation Administration (FAA) FAR Part 147 maintenance technician school for airframe and powerplant mechanics. This concentration requires the completion of

1. 45 hours of aerospace courses as listed below;
2. a minor that complements the major recommended by the faculty advisor and approved by the department chair and dean;

3. other specific required courses as listed below; and
4. FAA Airframe and Powerplant Certification prior to graduation.

**Recommended Sequence and Curriculum Requirements**

| <b>FRESHMAN</b>             |           | <b>SOPHOMORE</b>            |           |
|-----------------------------|-----------|-----------------------------|-----------|
| AERO 1010, 1020             | 6         | AERO 2331, 2371, 2342       | 9         |
| AERO 1340, 1380, 2381       | 9         | ENGL 2020 or 2030 or        |           |
| ENGL 1010, 1020 (Comm)      | 6         | HUM 2610 (Hum/FA)           | 3         |
| MATH 1710 (Math)            | 3         | Humanities and/or Fine Arts | 3         |
| MATH 1810                   | 3         | HIST 2010, 2020, or 2030    | 6         |
| COMM 2200 (Comm)            | 3         | CHEM 1010 (Nat Sci)         | 4         |
| Humanities and/or Fine Arts | 3         | PHYS 2010/2011 (Nat Sci)    | 4         |
| Social/Behavioral Sciences  | 3         | CSCI 1000                   | 1         |
|                             | <b>36</b> | ETIS 1310                   | 4         |
|                             |           |                             | <b>34</b> |
| <b>JUNIOR</b>               |           | <b>SENIOR</b>               |           |
| AERO 3020, 3030             | 6         | AERO 3362, 3371, 4040       | 9         |
| AERO 3301, 3322, 3392       | 9         | AERO 4310, 4332, 4342       | 9         |
| AERO 4301, 4311, 4312       | 9         | AERO 4371, 4381, 4392       | 9         |
| E T 3600 or 3610            | 4         | MGMT 4510                   | 3         |
| MGMT 3610 or E T 3910       | 3         |                             | <b>30</b> |
| Social/Behavioral Sciences  | 3         |                             |           |
|                             | <b>34</b> |                             |           |

**NOTE:** Additional aerospace maintenance courses are required if FAA certification is sought. Students enrolled in the Airframe and Powerplant Technician's Program are required to pass a comprehensive qualification examination prior to receiving authorization to take the FAA examination or prior to receiving a Certificate of Completion from MTSU.

**Concentration: Professional Pilot**

In addition to all academic requirements, this concentration requires students to obtain pilot certificates at the MTSU Flight School. All required flight training for this concentration is conducted in flight labs. Admission to the University does not guarantee enrollment in a flight lab. To enroll in a flight lab, students must submit a Flight Lab Request Form for each and every semester. The deadline to submit a Flight Lab Request Form for the summer or fall semester is March 1 each year. The deadline to submit a Flight Lab Request Form for the spring semester is October 1 each year. Enrollment in flight labs is limited and selection is made from eligible candidates who are best qualified. Most incoming freshmen will start flight training in their second semester at MTSU. To become eligible for a flight lab, candidates must meet the following minimum standards:

1. have a college cumulative grade point average of 2.50 (entering freshman will have their ACT scores ranked for admission into the flight lab during their first semester);
2. have a current Second Class FAA medical certificate;
3. be in good standing within the department and University (if a transfer, candidate cannot be on probation in any form);
4. have no physical disability that would prohibit completion of the course requirements.

The Professional Pilot concentration requires the completion of

1. 48 semester hours in aerospace courses as listed below;
2. a minor that complements the Professional Pilot major, recommended by the faculty advisor and approved by the department chair and dean;
3. other specific required courses as listed below; and

4. the Instrument Rating–Airplane, the Commercial Pilot Certificate, and the Commercial Multiengine Rating with instrument privileges all at the MTSU Flight School and in the flight labs.

Retention in the program is based on maintaining a cumulative GPA of 2.50 or better and making consistent and satisfactory progress in flight training. Violation of any MTSU safety practice and procedure or any FAA regulations will result in immediate termination from the flight program.

Students admitted to the Professional Pilot program must receive all required flight training beyond the Private Pilot Certificate at the MTSU Flight School. Credit for flight time, including cross-country flight time obtained by the student after becoming a private pilot, is very limited and is determined by FAA and MTSU regulations. Transfer students who come to MTSU already holding the Instrument Rating may be admitted; however, they must complete the Commercial Pilot Certificate, the Maintenance Rating, and Flight Instructor Certificate at the MTSU Flight School. Students entering MTSU who already hold the Commercial Pilot Certificate are not eligible for the Professional Pilot concentration.

**Recommended Sequence and Curriculum Requirements**

| <b>FRESHMAN</b>          |           | <b>SOPHOMORE</b>           |           |
|--------------------------|-----------|----------------------------|-----------|
| AERO 1010, 1020, 2010    | 9         | AERO 3202, 3203            | 2         |
| AERO 2220 or 2230        | 3         | AERO 3020, 3210            | 6         |
| ENGL 1010, 1020 (Comm)   | 6         | ENGL 2020 or 2030 or       |           |
| COMM 2200 (Comm)         | 6         | HUM 2610 (Hum/FA)          | 3         |
| MATH 1710 (Math)         | 3         | Humanities and/or          |           |
| CHEM 1010 (Nat Sci)      | 4         | Fine Arts (2 prefixes)     | 6         |
| PHYS 2010/2011 (Nat Sci) | 4         | Social/Behavioral Sciences |           |
|                          | <b>32</b> | (2 prefixes)               | 6         |
|                          |           | HIST 2010, 2020, or 2030   | 6         |
|                          |           | MATH 1810                  | 3         |
|                          |           |                            | <b>32</b> |
| <b>JUNIOR</b>            |           | <b>SENIOR</b>              |           |
| AERO 3030, 3204, 3261    | 5         | AERO 4100 or 4110          | 3         |
| AERO 3215, 3260, 3440    | 9         | AERO 4040, 4130, 4310,     |           |
| CSCI 1150 or             |           | 4440                       | 12        |
| INFS 2200 or 3100        | 3         | MGMT 3610                  | 3         |
| BMOM 3510 or ENGL 3520   | 3         | Minor                      | 9         |
| Minor                    | 9         |                            | <b>27</b> |
|                          | <b>29</b> |                            |           |

**Concentration: Technology**

The Technology concentration is designed for students interested in technical careers in aerospace and as preparation for those who seek more advanced study at the graduate level. Students will receive a strong background in mathematics, the sciences, industrial studies, and the more technical courses in aerospace. This concentration requires the completion of

1. 36 semester hours of aerospace courses as listed below;
2. minors in Mathematics and Engineering Technology and Industrial Studies;
3. two semesters of general chemistry and two semesters of calculus-based physics;
4. other specific required courses as listed below.

**Recommended Sequence and Curriculum Requirements**

| <b>FRESHMAN</b>          |           | <b>SOPHOMORE</b>           |           |
|--------------------------|-----------|----------------------------|-----------|
| AERO 1010, 1020, 1380    | 9         | ENGL 2020 or 2030 or       |           |
| ENGL 1010, 1020 (Comm)   | 6         | HUM 2610 (Hum/FA)          | 3         |
| COMM 2200 (Comm)         | 3         | Humanities and/or          |           |
| HIST 2010, 2020, or 2030 | 6         | Fine Arts (2 prefixes)     | 6         |
| MATH 1710 (Math)         | 3         | Social/Behavioral Sciences |           |
| MATH 1810                | 3         | (2 prefixes)               | 6         |
|                          | <b>30</b> | CHEM 1010 (Nat Sci)        | 4         |
|                          |           | PHYS 2010/2011 (Nat Sci)   | 4         |
|                          |           | MATH 1820, 3020            | 6         |
|                          |           | CSCI 1000                  | 1         |
|                          |           | Elective                   | 3         |
|                          |           |                            | <b>33</b> |
| <b>JUNIOR</b>            |           | <b>SENIOR</b>              |           |
| AERO 3020, 3030          | 6         | AERO 2381 or 3301          | 3         |
| AERO 3440, 4170          | 6         | AERO 4301 or 4310          | 3         |
| MATH 3120                | 3         | AERO 4071 or 4160          | 3         |
| MATH 2010 or 2050        | 3         | AERO 4100, 4110, or 4150   | 3         |
| E T 1840, 2310           | 8         | AERO 4040, 4440            | 6         |
| E T 3210, 3830           | 6         | E T 3860                   | 3         |
|                          | <b>32</b> | E T 3950 or 4230           | 4         |
|                          |           |                            | <b>25</b> |

**Minor in Aerospace**

A minimum of 18 semester hours is required for the minor. The minor may emphasize administrative, piloting, or technical subject matter. Courses are chosen with the approval of the student's minor advisor.

**Accreditation**

In addition to regional accreditation, the following programs are formally approved by the Council on Aviation Accreditation: Aerospace Administration, Aerospace Maintenance Management, Aerospace Technology, and Professional Pilot.

**Academic Common Market**

Since the Aerospace Department is a participant in the Academic Common Market, students from selected southern states may enroll at MTSU on an **in-state** fee basis. Further information is available from the department or Admissions Office.

**Professional Relationships**

MTSU holds membership in the Aviation Technical Education Council, the Council on Aviation Accreditation, the National Business Aircraft Association, the National Intercollegiate Flying Association, and the University Aviation Association.

**Advanced Standing**

Specific aerospace course credit may be granted to holders of FAA Airframe/Powerplant Certificates. Such aeronautical credential-based credit awards are applicable to MTSU enrollments only and will not transfer to other institutions.

**Maintenance Management Advanced Standing**

Only students pursuing the Maintenance Management concentration may receive advanced standing for certificates held.

Students seeking advanced standing on the basis of possession of the Airframe or Powerplant (or both) Technician Certificates must produce documentation to substantiate prior training to the dean of the College of Basic and Applied Sciences through the chair of the Aerospace Department. In addition, each applicant will be required to pass an oral or written examination covering the course content of each course for which advanced standing is requested. Twenty-four semester hours will be the maximum credit allowed for both certificates.

Holders of an FAA Airframe Technician Certificate may be granted credit for the following courses:

|           |                                      |
|-----------|--------------------------------------|
| AERO 1020 | Theory of Flight                     |
| AERO 1380 | Aerospace Maintenance Shop Practices |
| AERO 3301 | Sheet Metal Structures               |
| AERO 4310 | Aerospace Vehicle Systems            |

Holders of an FAA Powerplant Technician Certificate may be granted credit for the following courses:

|           |  |
|-----------|--|
| AERO 3030 | Propulsion Fundamentals                                  |
| AERO 3392 | Reciprocating Engine Maintenance Repair                  |
| AERO 3322 | Aerospace Reciprocating Engine Overhaul                  |
| AERO 3362 | Advanced Aerospace Engine Systems Maintenance and Repair |

Holders of FAA Repairmen Certificates and former military mechanics who are not holders of an FAA Maintenance Technician Certificate may not be granted specific course credit for their experiences.

**Air Traffic Control Training**

MTSU is a participant in the FAA Collegiate Training Initiative (CTI). Students who successfully complete this program are recommended to attend the FAA's Air Traffic Controller Training Course in Oklahoma City.

Students wishing to enroll in the CTI Program must

1. be at least 16 years of age and possess a high school diploma;
2. hold United States citizenship;
3. obtain employment as an FAA Air Traffic Controller by age 31;
4. pass an FAA physical examination (to include hearing and vision tests and drug screening);
5. pass a background security suitability examination; and
6. complete the following aerospace courses:

|           |                                  |
|-----------|----------------------------------|
| AERO 1010 | Introduction to Aerospace        |
| AERO 1020 | Theory of Flight                 |
| AERO 1230 | Aviation Laws and Regulations    |
| AERO 2010 | Aviation Weather                 |
| AERO 2220 | Navigation                       |
| AERO 3210 | Instrumental Flight Fundamentals |
| AERO 3230 | Crew Resource Management         |
| AERO 4530 | Air Traffic Control              |
| AERO 4560 | Advanced Air Traffic Control     |

**NOTE:** Additional requirements and disqualifying conditions pertain to enrollment in this program. For further information, contact the Aerospace Department at (615) 898-2788.

## Aircraft Maintenance Training

The Aerospace Department offers maintenance training which will qualify students for the FAA's Airframe and Powerplant Mechanics Certificate. The following courses are required for this qualification.

|      |      |   |
|------|------|---|
| AERO | 1020 | Theory of Flight  |
| AERO | 1340 | Introduction to Aerospace Maintenance                       |
| AERO | 1380 | Aerospace Maintenance Shop Practices                        |
| AERO | 2331 | Airframe Inspection   |
| AERO | 2342 | Powerplant Inspection                                       |
| AERO | 2371 | Aircraft Welding  |
| AERO | 2381 | Non-Metallic Structures: Dope, Fabric, and Finishing        |
| AERO | 3030 | Propulsion Fundamentals                                     |
| AERO | 3392 | Reciprocating Engine Maintenance Repair                     |
| AERO | 3301 | Sheet Metal Structures                                      |
| AERO | 4311 | Aerospace Accessory Systems Maintenance and Repair          |
| AERO | 3322 | Aerospace Reciprocating Engine Overhaul                     |
| AERO | 4332 | Reciprocating Engine Troubleshooting                        |
| AERO | 3371 | Aircraft Finishing and Non-Destructive Inspection           |
| AERO | 3020 | Aerospace Materials   |
| AERO | 4310 | Aerospace Vehicle Systems                                   |
| AERO | 3362 | Advanced Aerospace Engine Systems Maintenance and Repair    |
| AERO | 4371 | Advanced Aerospace Vehicle Systems Overhaul                 |
| AERO | 4381 | Advanced Aerospace Accessory Systems Maintenance and Repair |
| AERO | 4392 | Aerospace Turbine Engine Maintenance and Overhaul           |
| AERO | 4301 | Advanced Aerospace Vehicle Structural Repair                |
| AERO | 4312 | Turbine Engine Systems                                      |
| AERO | 4342 | Turbine Engine Inspection and Troubleshooting               |
| ET   | 3610 | Introduction to Electricity and Electronics                 |
| ETIS | 1310 | Basic Technical Drawing and Sketching                       |
| MATH | 1710 | College Algebra   |
| OR   |      |   |
| MATH | 1730 | Algebra and Trigonometry                                    |
| PHYS | 2010 | Non-Calculus-Based Physics I                                |
| PHYS | 2011 | Physics Problems Laboratory I                               |

## Flight Training

The Aerospace Department offers flight training to MTSU students pursuing the Professional Pilot concentration. All training will be conducted in University-owned and maintained aircraft by a select group of flight instructors screened and trained for their positions by MTSU. All flights will be conducted from the Murfreesboro Municipal Airport. Flight fees will be paid directly to MTSU, and students must maintain a positive balance in their training accounts at all times. Financial aid support materials may be obtained from the faculty coordinator in the Aerospace Department.

**NOTE:** Students interested in military flying careers should contact their local Armed Forces recruiting officer or MTSU's Reserve Officer Training Corps (ROTC) program representatives. Air Force ROTC program information can be obtained by calling (615) 963-5931. For information regarding the Army ROTC Program, call (615) 898-2470. Please see page 95.

## Student Organizations

Recognized student organizations in aerospace are Alpha Eta Rho, international aviation fraternity (co-ed); Flying Raiders, intercollegiate competitive flight team; AERO Maintenance Club of MTSU, aircraft maintenance organization; Future Airport Executives (FAE), student chapter of the American Association of Airport Executives; and Women in Aviation, student chapter of Women in Aviation International.

## Courses in Aerospace [AERO]

- 1010 Introduction to Aerospace.** Three credits. History of aerospace, opportunities in the field, fundamentals of flight, navigation, meteorology, and Federal Aviation Regulations. Open to all students desiring a general and practical knowledge of aviation.
- 1020 Theory of Flight.** Three credits. Basic aerodynamics with emphasis on lift, weight, thrust, and drag forces acting upon an airplane in flight. Five-hour flight demonstration required at student expense. Fee required.
- 1230 Aviation Laws and Regulations.** Three credits. Those portions of Titles 14 and 49 of the U.S. Code of Federal Regulations concerning airman certification and aircraft operations.
- 1340 Introduction to Aerospace Maintenance.** Three credits. Organization and operation of aircraft maintenance activities. Federal regulations and aviation maintenance law. Maintenance management function in practical settings.
- 1380 Aerospace Maintenance Shop Practices.** Three credits. Use of common tools, measuring devices, and special aircraft tools. Shop layout for aircraft maintenance management.
- 2010 Aviation Weather.** Three credits. Atmosphere, measurement of meteorological elements, and effects of these on air operations.
- 2140 Civil Aviation.** Three credits. Historical development and present status of air transportation facilities; state and federal regulations; legal characteristics of aerospace industry; problems and services of commercial air transportation.
- 2201 Private Pilot Flight Laboratory.** One credit. Prerequisite: Simultaneous completion of AERO 2230. Flight instruction leading to the FAA Private Pilot Certificate. The certificate must be completed during this course. Fee required.
- 2220 Navigation.** Three credits. The principles of pilotage, dead reckoning, and radio/electronic methods of navigation as applied to cross-country flight planning.
- 2230 Private Pilot Fundamentals.** Three credits. Aeronautical subject matter pertaining to the Private Pilot Certificate.
- 2331 Airframe Inspection.** Three credits. Requirements, techniques, and procedures.
- 2342 Powerplant Inspection.** Three credits. Requirements, techniques, and procedures.
- 2371 Aircraft Welding.** Three credits. Various types of aircraft welding techniques and procedures.
- 2381 Non-Metallic Structures: Dope, Fabric, and Finishing.** Three credits. Aircraft fabric covering and finishing.

- 2930 Cooperative Education.** Three credits. Provides students with opportunities for on-the-job experiences related to academic major. Consult department. Pass/Fail.
- 2940 Cooperative Education.** Three credits. Provides students with opportunities for on-the-job experiences related to academic major. Consult department. Pass/Fail.
- 3020 Aerospace Materials.** Three credits. Explores materials used in aerospace applications throughout their development from the standpoint of their properties, economic impact, and future possibilities. The need for new materials to fill current requirements included.
- 3030 Propulsion Fundamentals.** Three credits. Principles of operations, major components, and important features of typical propulsion systems used in aircraft and missiles, from reciprocating to reaction.
- 3050 Women in Aviation.** Three credits. Explores the many roles of women in this nontraditional field. Research on the history of women in aviation and their political and social impact on aviation, industry, and the country.
- 3080 Aviation Weather II.** Three credits. Prerequisite: AERO 2010. Advanced weather concepts, forecasting, and applications to flight dispatch problems. Preparation for NWS observers license.
- 3100 Aerospace in Our Lives.** Three credits. Open course for non-majors which allows exploration of the aerospace world in which we live. Credit not applicable to Aerospace major.
- 3170 Flight Safety.** Three credits. Prerequisite: AERO 1020. Safety rules and regulations and aircraft accident investigation.
- 3202 Cross-Country Flight Lab.** One credit. Prerequisite: Private Pilot Certificate. Flight instruction leading to the FAA Instrument Rating-Airplane, single engine land. Students should consult with the chief instructor pilot for a scheduled flight slot. Fee required.
- 3203 Instrument Rating Flight Lab.** One credit. Prerequisites: Private Pilot Certificate, AERO 3202 or equivalent, and completion of AERO 3210 or simultaneous study. Flight instruction leading to the FAA Instrument Rating-Airplane, single engine land. The instrument rating must be completed during this course. The student should consult with the chief instructor pilot for a scheduled flight slot. Fee required.
- 3204 Commercial Flight Laboratory.** One credit. Prerequisites: Private Pilot Certificate, Instrument Rating-Airplane, single engine land, AERO 2010, 2220, 3030 or equivalent for each, and completion of AERO 3215 or simultaneous study. Flight instruction leading to the Commercial Pilot Certificate-Airplane, single engine land. The commercial certificate must be completed during this course. Students should consult with the chief instructor pilot for a scheduled flight slot. Fee required.
- 3205 Conventional Landing Gear Airplane Laboratory.** One credit. Prerequisite: Private Pilot Certificate. Flight and ground instruction leading to conventional landing gear operation endorsement. Course includes flight and ground instruction. Fee required.
- 3206 Advanced Conventional Landing Gear Flight Laboratory.** One credit. Prerequisite: AERO 3205. Flight and ground instruction in a high-performance conventional landing gear aircraft leading to a log book endorsement in this type of aircraft. Fees required. NOTE: This is not an FAA Part 141 course.
- 3210 Instrument Flight Fundamentals.** Three credits. Prerequisite: Private Pilot Certificate. Flight instruction and academics required for the instrument airplane rating.
- 3215 Commercial Flight Fundamentals.** Three credits. Prerequisite: Private Pilot Certificate. Flight instruction and academics required for the Commercial Pilot Certificate.
- 3222 High-Altitude Aircraft Operations Laboratory.** One credit. Prerequisite: AERO 3240. Simulator and ground instruction in an aircraft simulator leading to a high-altitude log book endorsement. Fees required: NOTE: This is not an FAA-approved Part 141 course.
- 3223 High-Performance Aircraft Flight Laboratory.** One credit. Prerequisite: AERO 3204. Flight and ground instruction in a high-performance aircraft leading to a log book endorsement in this type of aircraft. Fees required. NOTE: This is not an FAA-approved Part 141 course.
- 3225 High-Altitude Aircraft Operations.** One credit. Prerequisite: Department head or chief pilot approval. A specialized flight-related course for certifying pilots for the ground portion of high-altitude flight in accordance with Federal Aviation Administration regulations.
- 3230 Crew Resource Management.** Three credits. Augments the student's ability to understand the emotional and logical gaps in communication in the present-day aviation crew environment by developing a better understanding of the student's relational style and personality traits in himself/herself and others. Personality profile is optional and confidential.
- 3240 Advanced Flight Operations.** Three credits. Prerequisites: Commercial Pilot Certificate, Instrument Rating-Airplane, Multiengine Rating-Airplane, MTSU Aerospace student. Two-hour blocks of instruction in classroom and flight simulator for students who desire first officer preparation and turbine engine transition. First officer candidates for the MTSU owned or operated passenger-transporting aircraft will be required to complete this course. Fee required.
- 3241 Air Charter Flight Laboratory.** One credit. Prerequisites: AERO 3202, 3203, 3204, 3223, 3240, and 3260; consent of instructor. Air charter operation. Students will be utilized as co-pilots during transportation of university personnel. NOTE: This is not an FAA-approved Part 141 course.
- 3250 Flight Simulator.** Three credits. Instruction in the use of the flight simulator and development of proficiency to fly under instrument conditions.
- 3260 Multiengine Rating.** Three credits. Prerequisite: Commercial Pilot/Instrument Rating. Flight and ground instruction pertaining to the multiengine rating. Students should consult chief flight instructor for a scheduled flight slot. The multiengine rating must be completed during the course. Fee required.
- 3261 Multiengine Rating Flight Lab.** One credit. Prerequisites: Single Engine Commercial Pilot Certificate with Instrument Rating. Corequisite: AERO 3260. Covers all topics of the Multiengine Practical Test Standards. Flight and ground instruction leading to the FAA Multiengine add-on rating. Multiengine rating required for course completion. Fee required.
- 3301 Sheet Metal Structures.** Three credits. Provides practical experience in the repair of sheet metal structures, including major repairs and alterations.

- 3322 Aerospace Reciprocating Engine Overhaul.** Three credits. Completion of a major overhaul on an aircraft engine, including procedures and acceptable techniques used in engine disassembly, inspection, repair, reassembly, and operational testing.
- 3362 Advanced Aerospace Engine Systems Maintenance and Repair.** Three credits. The operation of powerplant component systems; induction, exhaust, instrumentation, engine electrical, and propeller systems.
- 3371 Aircraft Finishing and Non-Destructive Inspection.** Three credits. Fundamentals of non-destructive inspection techniques including dye penetrant, magnetic particle, eddy current, and ultrasonic inspection.
- 3392 Reciprocating Engine Maintenance Repair.** Three credits. Reciprocating engines including theory, construction, fuel metering, ignition, and operational maintenance procedures. Inspection and repair processes are applied to operating engine systems.
- 3440 Fundamentals of Aerodynamics.** Three credits. Prerequisites: PHYS 2010 and MATH 1730 or equivalent. Aerodynamics of powered flight. Includes theories of lift and drag and fundamentals of stability and control.
- 3970 Cooperative Education.** Three credits. Provides students with opportunities for on-the-job experiences related to academic major. Consult department. Pass/Fail.
- 3980 Cooperative Education.** Three credits. Provides students with opportunities for on-the-job experiences related to academic major. Consult department. Pass/Fail.
- 4040 Aerospace Seminar.** Three credits. Prerequisite: Senior status or final semester of aerospace program. A capstone course involving analysis, synthesis, and integration of relevant academic experiences. Required of all aerospace students prior to graduation.
- 4050 Aerospace Internship I.** Three credits. Prerequisites: Junior standing and consent of department chair. Student is employed by an acceptable airline, airport director, or aerospace industry for 300 hours of field work. Pass/Fail.
- 4060 Aerospace Internship II.** Three credits. Prerequisites: Junior standing and consent of department chair. A continuation of the internship program with a different employer and place of work or a significant job category change. Pass/Fail.
- 4071 Problems in Aerospace.** One to three credits. Individual directed study in the field of aerospace.
- 4075 Selected Readings in Aerospace.** Three credits. Guided readings in aviation or space; alternates each semester. Topics range from historical events to possible future developments. Discussion, presentations, and critical analysis of material.
- 4100 Airline Management.** Three credits. Airline operation and implementation of sound management practice.
- 4110 Airport Management.** Three credits. Airport operations and development of airport master plan.
- 4130 Aerospace Physiology.** Three credits. Instruction, readings, and structured experiences to insure familiarity with the various physiological and health-related factors affecting a flyer's safety and performance.
- 4150 Fixed Base Operations Management.** Three credits. The FBO operator and the essential role played in general aviation.
- 4160 Aviation Law.** Three credits. Legal responsibility in the aviation industry.
- 4170 Airport Planning and Design.** Three credits. Methods utilized; the relationship of the airport and the community.
- 4201 Flight Instructor - Airplane Lab.** One credit. Prerequisites: Current FAA Commercial Pilot Certificate, AERO 3220, and consent of the instructor. Flight and ground instruction leading to the FAA Flight Instructor - Airplane Certificate. Covers all topics of the Flight Instructor - Airplane Practical Test Standards. Flight fees required. NOTE: This is not an FAA Part 141 course.
- 4202 Flight Instructor - Instrument Lab.** One credit. Prerequisites: Current FAA Commercial Pilot Certificate with an instrument rating, AERO 3210, and consent of the instructor. Flight and ground instruction leading to the FAA Flight Instructor - Instrument Certificate. Covers all topics of the Flight Instructor - Instrument Practical Test Standards. Flight fees required. NOTE: This is not an FAA Part 141 course.
- 4203 Flight Instructor - Multiengine Lab.** One credit. Prerequisites: Current FAA Commercial Pilot Certificate with an Instrument rating, AERO 3260, and consent of the instructor. Flight and ground instruction leading to the FAA Flight Instructor - Multiengine Certificate. Covers all topics of the Flight Instructor - Multiengine Practical Test Standards. Flight fees required. NOTE: This is not an FAA Part 141 course.
- 4210 Flight Instructor Fundamentals.** Three credits. Prerequisites: Commercial Pilot Certificate, Instrument Rating-Airplane. Ground instruction leading to the Certificated Flight Instructor - Airplane, Single Engine Land. At least one FAA Ground Instructor Certificate must be completed during the course. Fee required for ground instructor exams. Students should consult with the chief flight instructor for a scheduled flight slot. Fee required.
- 4220 Flight Instruction VI.** Three credits. Prerequisite: Certified Flight Instructor Certificate. Ground and flight instruction leading to the instrument and multiengine instructor ratings. Flight training for this course is to be taken at the MTSU Flight School. The ratings must be completed during the course. Students should consult with the chief flight instructor for a scheduled flight slot. Fee required.
- 4230 Advanced Air Navigation.** Three credits. Advanced navigation equipment and operation procedures, GPS, and LORAN.
- 4240 Aircraft Systems Management.** Three credits. Instruction and requirements pertaining to the activities of a flight engineer.
- 4301 Advanced Aerospace Vehicle Structural Repair.** Three credits. Nontypical structures including bonded and plastic structures. Includes planning and organizing of major structural repair projects and rebuilding of severely damaged aircraft.
- 4310 Aerospace Vehicle Systems.** Three credits. Design, use, and function of typical hydraulic, mechanical, and electrical systems used on transport category aircraft. Designed for potential pilots, flight engineers, and managers.
- 4311 Aerospace Accessory Systems Maintenance and Repair.** Three credits. A laboratory course providing experience in the maintenance, inspection, and repair of aircraft system components.

- 4312 Turbine Engine System.** Three credits. Advanced course in the maintenance of complex systems.
- 4332 Reciprocating Engine Troubleshooting.** Three credits. A laboratory course providing practical experience in inspecting and troubleshooting problems with reciprocating engines and powerplant systems.
- 4342 Turbine Engine Inspection and Troubleshooting.** Three credits. A laboratory course providing practical experience in turbine engine inspection to include hot section inspection, engine operation, and troubleshooting.
- 4371 Advanced Aerospace Vehicle Systems Overhaul.** Three credits. Complete repair and overhaul of complex aerospace vehicle systems including hydraulics, electric, pneumatics, fuel, and oil. Shop layout and quality control procedures stressed.
- 4381 Advanced Aerospace Accessory Systems Maintenance and Repair.** Three credits. Repair and overhaul of complex accessory systems and subsystems. Practical experience in overhaul of air conditioning, pressurization, power brakes, constant speed drives, and jet fuel controls.
- 4392 Aerospace Turbine Engine Maintenance and Overhaul.** Three credits. A laboratory course in field maintenance and repair of turbine engines and components. Includes limited overhaul procedures and techniques. Management procedures stressed.
- 4400 Space.** Three credits. History of global space exploration and the successes and failures of manned and unmanned efforts in the race to the moon.
- 4440 Aircraft Performance.** Three credits. Prerequisites: MATH 1730 and PHYS 2010 or equivalent. Determination of performance from basic lift, drag, power, and structural characteristics of the airplane. Use of flight charts. Effects of loading on performance.
- 4490 Aerospace Science for Teachers.** Three credits. An introduction to the total aviation and space effort.
- 4530 Air Traffic Control.** Three credits. FAA Air Traffic Control system used to regulate air traffic during enroute and terminal phases of flight, with emphasis on communication, navigation, control equipment, and procedures.
- 4560 Advanced Air Traffic Control.** Four credits. Prerequisites: AERO 2220, 3210, and 4530. Capstone course for FAA Collegiate Training Initiative. Focuses on mastery of concepts acquired in AERO 4530. Includes computer simulations conducted in high-density, high-workload conditions. Emphasizes situational analysis, decisive action, and problem-solving ingenuity in terminal and enroute ATC environments. One three-hour lecture and one one-hour laboratory.
- 4580 Flight Dispatch/ATP Written Preparation.** Three credits. Prerequisite: Approval of instructor. Academics for the ATP written. If flight is desired, student will meet FAR 61. Fee required.
- 4590 Flight Dispatch.** Three credits. Prerequisite: AERO 4580. A capstone for those seeking flight dispatch as a career. This course should be the last one in the student's program.
- 4730 Honors Seminar in Aviation Psychology.** Three credits. Application and physiological testing and research techniques in aviation education, management, and technology.



## Courses in Transportation [TRNS]

- 1610 Introduction to Transportation.** Three credits. Transportation development, identification, and evaluation of the elements of the transportation system including historical, legislative, and trend analysis.
- 2620 Transportation Freight Systems.** Three credits. An overview of cargo systems and transportation freight rates. Includes an analysis of transportation issues and the relationship between the shipper, the modes of transportation, and the consumer.
- 3630 Transportation Systems.** Three credits. Prerequisite: TRNS 1610 or permission of instructor. An overview of the structure and management of a logistics distribution system. Distribution logistics as a function area and as a strategic element of the total transportation system.

## Honors College

The Department of Aerospace offers periodically 1020, 4071, and 4730.

## Graduate Study

The Aerospace Department offers the Master of Science in Aviation Administration and the Master of Education in Aerospace Education. Requirements for these degrees and a list of the courses offered for graduate credit are published in the Graduate Catalog.