Aviation

College of Education
Department of Aviation
328 Armstrong Hall • 507-389-6116

Nihad Daidzic, Joel Patrick McKinzie, Jeff Peterson, Thomas Peterson

Aviation Program Mission Statement. The mission of Minnesota State University, Mankato’s aviation program is to educate students today who will become professionals responsible for the safe and efficient design, management, and operation of the aviation system tomorrow. The program combines all elements of a substantive university education with aviation, flight, and management components to graduate well prepared aviation professionals. Acquisition of airmanship knowledge, skills, and ability while in college develops professionalism, responsibility, self-reliance and marketable skills for early career progression, and provides important experiences which ensure a level of understanding and competency essential to becoming an effective leader in an aviation profession.

Advising. Aviation students will be assigned a faculty advisor following an initial or transfer orientation session. Faculty advising appointments may be scheduled directly with your faculty advisor. College of Education Student Relations Coordinator, is available for general education advisement. Students may make appointments with the College of Education Academic Advising Office in 117 Armstrong Hall, phone # 507-389-1215.

Admission to Major. Coordinator for Admission to Major, Mymique Baxter, 117 Armstrong Hall.

All students must submit an unofficial transcript or DARS report (available at the Campus Hub).

Students must meet the following requirements:
- a minimum of 32 earned semester credit hours.
- a minimum cumulative GPA of 2.50.

Students may enroll in 100 and 200 aviation coursework prior to admission to major.

POLICIES/INFORMATION

Flight Lab. Flight costs are determined on an hourly basis for aircraft and flight instruction. To obtain FAA certifications requires FAA exams which may require a fee.

Transfer of college credit and credit for certificates and/or ratings. The Minnesota State Mankato Department of Aviation bases its flight education philosophy in a four-year university degree. Consequently, students who have obtained flight certificates/ratings without earned college credit may not have satisfied the academic and flight requirements for the aviation major. Students must demonstrate that they have received the full breadth and depth of knowledge, skills, abilities, and attitudes consistent with an education received at Minnesota State Mankato. Once enrolled at Minnesota State Mankato, students are expected to complete all subsequent flight training within Minnesota State Mankato’s aviation program.

Transfer credits. To satisfy aviation curriculum requirements, students with pilot certificates and ratings earned with college credit through an Aviation Accreditation Board International (AABI) accredited university may transfer those credits without demonstration of proficiency. College credits obtained through a non AABI accredited institution will be reviewed by the Department of Aviation to ensure the issuing institution follows policies and practices consistent with AABI accreditation standards. In the event credits do not transfer, students may be required to follow Credit for Experience procedures.

Prior Experience. Students entering Minnesota State Mankato with completed FAA certificates must register for and complete the requirements for the applicable ground school and flight lab courses. Prior flight experience will be evaluated by the faculty and may result in advanced standing in flight labs. Students are responsible for aircraft rental required for the evaluation.

GPA Policy. Admission to College of Education, 2.0 cumulative GPA.

P/N Grading Policy. Only elective and general education courses may be taken P/N, unless offered P/N only.

AVIATION BS

Degree completion = 120 credits

Major Common Core
AVIA 101 World of Aviation (3)
AVIA 150 Private Pilot (4)
AVIA 334 Aviation Management (4)
AVIA 437 Aviation Safety (4)
AVIA 445 Aviation Human Factors (3)

Major Emphasis: Professional Flight Concentration
AVIA 151 Private Pilot Flight Lab (3)
AVIA 171 Multi-Engine Flight Lab (1)
AVIA 240 Instrument Pilot (3)
AVIA 241 Instrument Pilot Flight Lab (3)
AVIA 250 Commercial Pilot (3)
AVIA 251 Commercial Pilot Flight Lab (3)
AVIA 338 Advanced Aircraft Systems (3)
AVIA 340 Flight Operations (3)
AVIA 360 Flight Instructor (3)
AVIA 361 Initial CFI-Airplane-Multiengine Flt Lab (1)
AVIA 362 Add-on CFI-A Single Engine Flt Lab (1)
AVIA 363 CFI-Instrument Airplane (CF-I) Flight Lab (1)
AVIA 432 Aviation Law-General (3)
AVIA 436 Flight Operations & Procedures (3)
AVIA 450 Professional Pilot Theory (3)
AVIA 451 Professional Pilot Course (3)
AVIA 455 Aircraft Performance (3)

Restricted Electives (choose 9 credits)
AVIA 102 Aviation Terminology (3)
AVIA 201 Theory of Flight (3)
AVIA 202 Principles of Air Navigation (3)
AVIA 333 Airline Operations (3)
AVIA 336 Basic Aircraft Systems (3)
AVIA 337 Avionics (3)
AVIA 339 Aerospace Propulsion (3)
AVIA 343 Airport Management (3)
AVIA 435 Aviation Law-Transactions (3)
AVIA 442 Fundamentals of Air Traffic Control (3)
AVIA 458 Aeromedical Factors (3)
AVIA 490 Aviation Workshop (1-10)
AVIA 497 Aviation Internship (1-12)
AVIA 499 Individual Study in Aviation (1-6)

Major Emphasis: Aviation Management Concentration
ACCT 200 Financial Accounting (3)
AVIA 343 Airport Management (3)
AVIA 432 Aviation Law-General (3)
AVIA 435 Aviation Law-Transactions (3)
BLAW 200 Legal,Political,and Regulatory Environment of Business (3)
ECON 201 Principles of Macroeconomics (3)
ECON 202 Principles of Microeconomics (3)
FINA 362 Business Finance (3)
MGMT 200 Introduction to MIS (3)
MGMT 330 Principles of Management (3)
MRKT 310 Principles of Marketing (3)

Restricted Electives (choose 15 credits)
AVIA 102 Aviation Terminology (3)
AVIA 150 Private Pilot Flight Lab (3)
AVIA 171 Multi-Engine Flight Lab (1)
AVIA 201 Theory of Flight (3)
## Aeronautics Minor

An Aeronautics minor in Aviation is obtained after completing 16 required aviation core courses and 10 aviation electives. The minor provides fundamentals of the Aeronautical and Aviation sciences that may result in the candidate obtaining pilot certificates provided the required flight training is completed and all practical tests passed.

### Minor Core

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AVIA 101</td>
<td>World of Aviation</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 150</td>
<td>Private Pilot</td>
<td>4</td>
</tr>
<tr>
<td>AVIA 437</td>
<td>Aviation Safety</td>
<td>4</td>
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### Elective

A plan of study must be completed and approved by the Aviation Department.

### Restricted Electives (choose 9 credits)

<table>
<thead>
<tr>
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<tbody>
<tr>
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</tr>
<tr>
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<td>Instrument Pilot</td>
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<td>AVIA 241</td>
<td>Instrument Pilot Flight Lab</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 250</td>
<td>Commercial Pilot</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 251</td>
<td>Commercial Pilot Flight Lab</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 333</td>
<td>Airline Operations</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 336</td>
<td>Basic Aircraft Systems</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 337</td>
<td>Avionics</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 343</td>
<td>Airport Management</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 432</td>
<td>Aviation Law - General</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 435</td>
<td>Aviation Law - Transactions</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 442</td>
<td>Fundamentals of Air Traffic Control</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 443</td>
<td>Airline Dispatch</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 445</td>
<td>Aviation Human Factors</td>
<td>3</td>
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## Private Flight Minor

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### Required Elective (choose 22 credits)

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<td>Multi-Engine Flight Lab</td>
<td>1</td>
</tr>
<tr>
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<td>Instrument Pilot</td>
<td>3</td>
</tr>
<tr>
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<td>Instrument Pilot Flight Lab</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 250</td>
<td>Commercial Pilot</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 251</td>
<td>Commercial Pilot Flight Lab</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 340</td>
<td>Flight Operations</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 436</td>
<td>Flight Operations &amp; Procedures</td>
<td>3</td>
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### Certificate Core

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</thead>
<tbody>
<tr>
<td>AVIA 150</td>
<td>Private Pilot</td>
<td>4</td>
</tr>
<tr>
<td>AVIA 201</td>
<td>Theory of Flight</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 202</td>
<td>Principles of Air Navigation</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 240</td>
<td>Instrument Pilot</td>
<td>3</td>
</tr>
<tr>
<td>AVIA 250</td>
<td>Commercial Pilot</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 217</td>
<td>Weather</td>
<td>4</td>
</tr>
<tr>
<td>GEOG 218</td>
<td>Weath Laboratory</td>
<td>1</td>
</tr>
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### Certificate Restricted Electives

**CHOOSE 2 CLUSTER:**
- **Helicopter or Airplane**
  - Select one group, either the helicopter option (12 credits) or the airplane option (10 credits).
## AVIA 101 (3) World of Aviation
Provides an expanded study of the changing and shrinking world brought on by the introduction of technology using the medium of aviation, especially the fixed-wing airplane, throughout the course of history. Students will analyze the significant impact and rapid changes aviation has had on cultures, commerce, wars, economics, and transportation. The effect the introduction and expansion of aviation technology has had throughout the world created many of the same effects the expansion of the internet has had over the last 20 years.

Fall, Spring

## AVIA 150 (4) Private Pilot
A study of basic aeronautical knowledge including principals of flight, aerodynamics, aviation regulations, weather, visual and instrument navigation, and emergencies. The course meets, but is not limited to, FAR part 61.105 (a, 1-6). Satisfactory completion of this course may result in an endorsement for the FAA Private Pilot written exam.

Fall, Spring

## AVIA 151 (3) Private Pilot Flight Lab
Provides beginning flight student with the in-flight requirements needed to obtain the FAA Private Pilot’s Certificate.

Fall, Spring

## AVIA 152 (3) Private Pilot Helicopter Flight Lab
Provides initial flight student with the in-flight training requirements needed to obtain the FAA private Pilot Helicopter Certificate.

On-Demand

## AVIA 171 (1) Multi-Engine Flight Lab
Prepares advanced flight student with the in-flight requirements needed to obtain the FAA Multi-Engine Pilot rating.

Pre: AVIA 151, or equivalent

Fall, Spring

## AVIA 201 (3) Theory of Flight
A study of physics and aerodynamic principals of flight and propulsion systems. The nature of aerodynamic forces are explained. Flight principals of lighter-than-air, airplane, glider, rotorcraft and powered lift are covered in detail.

Pre: AVIA 101, AVIA 150

Fall, Spring

## AVIA 202 (3) Principles of Air Navigation
A study of fundamental air navigation principles and how it is applied to flight. Pilotage and dead reckoning. Great circle navigation. Charts and conformal projects. Celestial navigation systems and their operations and use.

Pre: AVIA 150

Spring

## AVIA 240 (3) Principles of Air Navigation
A study of the aeronautical knowledge including aviation regulations, weather, instrument navigation, and instrument emergencies. The course meets, but is not limited to, FAR part 61.65 (b, 1-4). Satisfactory completion of this course may result in an endorsement for the FAA Instrument Pilot written exam.

Pre: AVIA 150, or equivalent

Fall, Spring

## AVIA 241 (3) Instrument Pilot Flight Lab
Prepares advanced flight students with the in-flight requirements needed to obtain the FAA Instrument Pilot rating.

Pre: AVIA 151, or equivalent

Fall, Spring

## AVIA 242 (3) Instrument Pilot Helicopter Flight Lab
Prepares advanced flight students with the in-flight requirements needed to obtain the FAA Instrument Pilot Helicopter rating.

Pre: AVIA 152

On-Demand

## AVIA 245 (3) Principles of Air Navigation
A study of the aeronautical knowledge including aviation regulations, weather, instrument navigation, and instrument emergencies. The course meets, but is not limited to, FAR part 61.125 (a, 1-4). Satisfactory completion of this course may result in an endorsement for the FAA Commercial Pilot written exam.

Pre: AVIA 151, AVIA 240

Fall, Spring

## AVIA 250 (3) Commercial Pilot
A study of advanced aeronautical knowledge, including aerodynamics, aviation regulations, weather, visual and instrument navigation, and emergencies. The course meets, but is not limited to, FAR part 61.125 (a, 1-4). Satisfactory completion of this course may result in an endorsement for the FAA Commercial Pilot written exam.

Pre: AVIA 151, AVIA 240

Fall, Spring

## AVIA 251 (3) Commercial Pilot Flight Lab
Prepares advanced flight students with the in-flight requirements needed to obtain the FAA Commercial Pilot’s Certificate.

Pre: AVIA 151, or equivalent

Fall, Spring

## AVIA 252 (3) Commercial Pilot Helicopter Flight Lab
Prepares advanced flight students with the in-flight requirements needed to obtain the FAA Commercial Pilot Helicopter Certificate.

Pre: AVIA 152, AVIA 242

On-Demand

## AVIA 270 (3) Helicopter Pilot
Study of Helicopter theory to meet FAA part 141 certification requirements for helicopter.

Pre: AVIA 150, AVIA 250, AVIA 260

On-Demand

## AVIA 275 (3) Helicopter Flight Theory
This course covers all the knowledge areas required for the FAA helicopter private, instrument and commercial pilot certification at a deeper and more academic level.

Variable
AVIA 333 (3) Airline Operations
Designed to cover the complex area of operation techniques and problems confronting the airlines today. Entails a study of marketing research, passenger trends, feasibility route studies, etc.
Fall, Spring

AVIA 334 (4) Aviation Management
Provides an understanding of management and financial techniques related to aviation businesses. Generally accepted and proven business techniques and proven business techniques are applied to the aviation setting.
Fall, Spring

AVIA 336 (3) Basic Aircraft Systems
Aircraft systems for light and medium category general aviation aircraft, includes the study of structure, control, electrical, fuel, environmental, landing gear, and engine systems. Examples of general aircraft category aircraft systems will be discussed from the pilots perspective.
Fall

AVIA 337 (3) Avionics
Principles of Avionics is an expanded course on the theory and Applications of Aviation Electronics for future pilots and students of aviation and aeronautics. The course highlights modern synthetic displays, navigation, automatic flight control, FMS, and other essential aircraft equipment. Variable

AVIA 338 (3) Advanced Aircraft Systems
Hydraulic, pneumatic, electrical, pressurization, environmental, and other systems for large-transport category aircraft are covered. Also turbine engines, primary and secondary flight controls, and miscellaneous important systems are examined. Examples of systems in large transport-category jets will be discussed from the pilot operational perspective.
Spring

AVIA 339 (3) Aerospace Propulsion
The course provides basic principles of operation and components description of the traditional and modern propulsion systems used in atmospheric and space transportation vehicles. Reciprocating engines with propellers, turbine jet engines, and chemical rockets are covered.
Fall, Spring

AVIA 340 (3) Flight Operations
Introduces students to airline training, regulations, and flight management systems (FMS). Students will develop an understanding of airline operations as they experience an FAA Part 121 style basic indoctrination. Students will be trained on procedures, requirements, and limitations for airline operations through all phases of flight and ground in a simulated Advanced Qualifications Program (AQP) style course. Students will also develop technical and procedural knowledge of FMS.
Fall, Spring

AVIA 343 (3) Airport Management
Course provides students with an overview of airport management. Studies include the day-to-day operations of air carrier and general aviation airports as well as planning, design, construction, finance and public relations associated with airport management. Students are exposed to many career opportunities in this area. The course includes a case study of the Minneapolis/St. Paul metropolitan area airport system and several site visits.
Spring

AVIA 360 (3) Flight Instructor
A study of the fundamentals of instruction including the learning process, effective teaching evaluation, course development, lesson planning, and instructing techniques. The course meets, but is not limited to, FAR part 61.187 (a, 1-6). Satisfactory completion of this course may result in an endorsement for the FOI and CFI-A written exam.
Pre: AVIA 150, AVIA 240, AVIA 241, AVIA 250
Fall, Spring

AVIA 361 (1) Initial CFI-Airplane-Multiengine Flt Lab
Prepares advanced flight students for the in-flight requirements needed to obtain the FAA Multi-Engine Flight Instructor’s Certificate.
Pre: AVIA 251 and AVIA 241, or equivalent
Fall, Spring

AVIA 362 (1) Add-on CFI-A-Single Engine Flt Lab
Prepares advanced flight students with the in-flight requirements needed to obtain the FAA Certified Flight Instructor’s Certificate.
Pre: AVIA 251 and AVIA 241, or equivalent
Fall, Spring

AVIA 363 (1) CFI-Instrument Airplane (CFI-I) Flight Lab
Prepares advanced flight students with the in-flight requirements needed to obtain the FAA Instrument Flight Instructor’s Certificate.
Pre: AVIA 251 and AVIA 241, or equivalent
Fall, Spring

AVIA 365 (1) Initial CFI-Airplane-Multiengine Flt Lab
Prepares advanced flight students for the in-flight requirements needed to obtain the FAA Multi-Engine Flight Instructor’s Certificate.
Pre: AVIA 251 and AVIA 241, or equivalent
Fall, Spring

AVIA 366 (1) Add-on CFI-A-Single Engine Flt Lab
Prepares advanced flight students with the in-flight requirements needed to obtain the FAA Certified Flight Instructor’s Certificate.
Pre: AVIA 251 and AVIA 241, or equivalent
Fall, Spring

AVIA 367 (1) CFI-Instrument Airplane (CFI-I) Flight Lab
Prepares advanced flight students with the in-flight requirements needed to obtain the FAA Instrument Flight Instructor’s Certificate.
Pre: AVIA 251 and AVIA 241, or equivalent
Fall, Spring

AVIA 383 (1) Flight Instructor Helicopter Flight Lab
Prepares advanced flight students with the in-flight requirements needed to obtain the FAA Certified Flight Instructor Helicopter Certificate.
Pre: AVIA 252
On-Demand

AVIA 392 (1) Instrument Instructor Helicopter Flight Lab
Prepares advanced flight students with the in-flight requirements needed to obtain the FAA Instrument Helicopter Flight Instructor Certificate.
Pre: AVIA 242, AVIA 252
On-Demand

AVIA 435 (3) Aviation Law - Transactions
This course will take an in-depth look at several legal topics that touch the aviation industry. The course will use the case study method to look at several aviation-related cases, including commercial airline accidents, pilot certificate actions, airline security violation cases, international aviation law, and several other current legal matters that involve the airline industry.
Pre: AVIA 432
Spring

AVIA 436 (3) Flight Operations & Procedures
Introduces advanced professional flight students to FAR Part 121 style standardized flight training in a regional jet. Course will include aircraft systems, procedures training, and techniques used in high performance turbine aircraft. Emphasis on standard operating procedures (SOP), crew resource management (CRM), and line oriented flight training (LOFT).
Pre: AVIA 340

AVIA 437 (4) Aviation Safety
The understanding and implementation of safe operating procedures. Assists the student in arriving at proper decisions related to periods of stress when operating as pilot in command. Various FAA regulations and standard and safe operating procedures are also discussed.
Fall, Spring

AVIA 442 (3) Fundamentals of Air Traffic Control
To provide the student with the basic knowledge of ATC as a career and the fundamentals necessary for FAA certification.
Fall
AVIA 443 (3) Airline Dispatch
Introduces the workings of the complex system of air control in the US and abroad. Covers such subjects as radio communications, airspace classification, radar control, and operation as well as aircraft separation. Looks at present and future air traffic control systems.
Spring

AVIA 445 (3) Aviation Human Factors
A study of various techniques designed to enhance management and leadership methods. Emphasizes decision-making and judgment skills as well as methods to improve effective communication and skills to develop a productive work environment for flight crew and other airline personnel.
Fall, Spring

AVIA 450 (3) Professional Pilot Theory
This course is designed to develop students technical understanding of information and knowledge required for Air Transport Pilots. Students will participate in a capstone research project and present their findings in a research paper and oral presentation. Course completion requirements will include preparation for the FAA ATP written exam.
Pre: AVIA 251, AVIA 340, AVIA 436
Coreq: AVIA 340, AVIA 436, AVIA 451
Fall, Spring

AVIA 451 (3) Professional Flight Course
Prepares students who desire careers as professional pilots. Emphasizes complete ground tutoring and flight instruction relating to instrument maneuvers, SOP's, regulation interpretation, pilot discipline, and professional procedures. Crew resource management, LOFT, and turbine-transition flights in an advanced jet flight simulator are used. This course is taken in conjunction in the same semester as AVIA 450.
Pre: AVIA 251
Coreq: AVIA 450
Fall, Spring

AVIA 452 (3) Professional Aviator Course
This is a stand-alone course designed for the person who is not an MSU aviation major. The course offers a complete jet aircraft transition training program.
Summer

AVIA 455 (3) Aircraft Performance
The fundamental principles and calculation of the performance in various phases of flight: takeoff and land, climb and descent performance, maximum-range and maximum-endurance cruise, single-engine performance in multi-engine aircraft, standard atmosphere and basic subsonic and supersonic aerodynamics is covered.
Pre: AVIA 201
Variable

AVIA 458 (3) Aeromedical Factors
Covers aeromedical factors that are essential for high-altitude flying aircraft. Hypoxia, hyperventilation, dysbarism, basic gas laws. Armstrong line, vision in flight, day and night. Pressurization systems, pressurized suits, danger of loss of cabin pressure, future HSCT and LEO commercial flights.
Variable

AVIA 490 (1-10) Aviation Workshop
Coreq: ANTH 491 or ANTH 492 or ANTH 493 or ANTH 494
Variable

AVIA 497 (1-12) Aviation Internship
Supervised experience in business, industry, state or federal institutions.
Fall, Spring

AVIA 499 (1-6) Individual Study in Aviation
Allows the student an individual course of study on an aviation topic to be arranged with the department.
Fall, Spring