COLLEGE OF TECHNOLOGY

M. Wesley Shultz, *Dean*
Gerald W. Coy, *Associate Dean*

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BACCALAUREATE DEGREE CORE REQUIREMENTS

The BSET and BT core requirements are as follows:

BSET—24

ENGR120, ELCT141, 142, MECT121, MECT235, INDT450, ENGT310, or ENGT396 or GTEC395 or INDT315

BT—8

ENGR370, INDT310, AGRI395 or GTEC395 or INDT315

General Courses **(Credits)**

See inside front cover for symbol code.

GTEC110 **(2)**
Freshman Seminar
College success and life enrichment skills. Included are an introduction to the resources of the university, principles of critical thinking, and Christian values clarification.

GTEC115 **(2)**
College Seminar
See description under GTEC110. Repeatable.

GTEC298 **(1-32)**
Prior Learning Assessment
Prior Learning Assessment (PLA) is a process which validates learning experiences occurring outside traditional college/university academic programs. A portfolio of evidence for demonstrating experience and competency justifies and determines the amount of credit granted. Repeatable with different topics.

GTEC395 **(1-6)**
Cooperative Work Experience
Supervised (by the dean or his appointee) on-the-job work experience with a cooperating industry. A minimum of 120 hours of work is required per credit. The student must submit a report of the cooperative work experience as specified by the instructor. Repeatable to 6 credits. Graded S/U. Prerequisites: an associate degree in technology or equivalent and permission of the dean. Students must apply and be accepted one semester in advance of their planned Cooperative Education experiences.

GTEC498 **(1-32)**
Prior Learning Assessment
See description under GTEC298. Total Prior Learning Assessment credits (GTEC298 and 498) may not exceed 32 credits.

INDIVIDUALIZED PROGRAMS OF STUDY

For students who have career goals or special interests in areas other than those provided in one of the established majors or minors, a special individualized program is available in the following degrees: Bachelor of Science, Bachelor of Science in Engineering Technology, Bachelor of Technology, and Associate of Technology. An individualized concentration may be planned to meet the career goals of a student. Before the beginning of the junior year for baccalaureate-degree students or the beginning of the sophomore year for associate-degree students, the student, with the assistance of his or her advisor, prepares a proposed program of study. The program must be approved by a department faculty and the College of Technology Academic Policies and Curricula Committee.

AERONAUTICAL TECHNOLOGY

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Faculty

Gary A. Marsh, *Acting Chair*
Richard L. Kaping
Ruth Ann Plue
Daniel Thompson

Academic Programs	**Credits**
BSET: Aircraft Engineering Technology	155
BT: Aviation Technology	124-128
Avionics and Maintenance	
Flight	
Flight and Business	
Flight and Maintenance	
Maintenance	
Maintenance and Business	
AT: Aviation Technology	62-74
Flight	
Maintenance (52)	
Minor in Aviation Technology	21
Flight	
Maintenance (32)	
FAA-approved Part 141–Flight Training	
Commercial Pilot	
Flight Instructor	
Instrument Rating	
Multi-Engine Rating	
Private Pilot	
FAA-approved Part 147–Maintenance Technician	
Aircraft Airframe	
Aircraft Powerplant	

Students may choose program emphases (or a combination of them) in such areas as flight, maintenance, business, avionics, and engineering technology.

Programs

If any of the degree programs do not meet the needs of the student, an individualized major is available as described on the previous page.

BSET: Aircraft Engineering Technology

The BSET degree combines the aviation maintenance program with selected engineering courses and thus prepares the individual for activities between the pure engineer and a skilled craftsman (licensed A & P Technician).

Maintenance area courses (see below)	52
Technical core	20
MECT285, 326, 355, 370, 375	
Degree core	24
General Education requirement	59
Total credits for degree	**155**

BT: Aviation Technology

Students taking the Bachelor of Technology degree may choose to combine two of the specialization options—flight, maintenance, business, and avionics—or they may combine areas (see below) to meet specific career goals or limit their specialization to a single area—flight or maintenance.

Major*	60-78
Degree core	8
General Education requirements	39-42
General electives	17-01
Total credits for degree	**124-128**

***Major Options**

Avionics and Maintenance
- Avionics (Electronics)—37 credits
- Maintenance (Airframe)—32 credits

Flight
- Flight—24-26 credits
- Flight electives—19-21 credits
- Aviation electives—15 credits

Flight and Business
- Flight—24-26 credits
- Aviation electives—12-10 credits
- Business (Pre-MBA)—24 credits (*to meet pre-MBA requirements*)

Flight and Maintenance
- Flight—24-26 credits
- Maintenance—52 credits
- Aviation Electives—20 credits

Maintenance
- Maintenance—52 credits
- Flight electives—8 credits

Maintenance and Business
- Maintenance—52 credits
- Business (Pre-MBA)—24 credits

AT: Aviation Technology

Students may earn an Associate of Technology degree by taking courses beyond those required for the certificate in either the flight or maintenance area. The additional courses give students a broader General Education base, prepare them better to perform the activities acquired by the certificate program, and facilitate study for an advanced degree.

Major*	40-52
General Education requirements	16-22
General electives	6-0
Total credits for degree	**62-74**

***Majors**

Flight
- Flight—24-26 credits
- Aviation electives—16-14 credits

Maintenance
- Maintenance—52 credits

Minor in Aviation Technology

Requirements: A minimum of 20 or 32 credits in flight or maintenance, respectively. Additional aviation electives must be approved by the department chair.

Students earn a minor in Aviation Technology by completing one of the following:

Flight (21 credits): AFLT111, 112, 202, 203, 301, 302, including Aeronautical electives of 3 credits. A Commercial Pilot certificate and instrument rating are required.

Maintenance: (32 credits) Complete either the Airframe or Powerplant License.

FAA Certification

FAA-Approved Instruction. The Department of Aeronautical Technology operates a Flight School as well as an Airframe and Powerplant Maintenance Technician School approved by the FAA under Title 14 CFR, Part 141 and Part 147, respectively.

FAA Flight Certification Programs. Students may take flight instruction to qualify for several levels of certification. Students wishing only to take the content courses necessary for the specific flying expertise can take just the flight area courses as outlined under the respective certification requirements.

AVIONICS AREA COURSES

Required Courses—37

AVIA395; ELCT141, 142, 235, 335, 360, 365, 380; ENGT310.

FLIGHT AREA COURSES

Private Pilot Certificate, Commercial Pilot Certificate, Instrument Rating, and either Flight Instructor's Certificate or Multi-Engine Rating are required for any degree.

Required Courses—60

AFLT111, 112, 202, 203, 301, 302 and 307 or 455, 456.

A student may take any of the above courses under FAA Part 61 with the permission of the Chief Pilot.

Aeronautical Technology electives are to be chosen in consultation with an advisor.

No more than 50% of the flight credits to be counted toward a major or minor in Aeronautical Technology may be taken as credit by examination.

MAINTENANCE AREA COURSES

FAA Maintenance Certificates. Students may earn the following FAA-approved certificates from the department's Aviation Maintenance Technician School:

Aircraft Airframe
Aircraft Powerplant

Maintenance students must obtain either the FAA Airframe or Powerplant license for any degree or certificate.

Required Courses—52

AVMT 108, 114, 116, 120, 204, 206, 210, 220, 226, 237, 304, 306, 308, 310, 314, and 316.

Courses

(Credits)

See inside front cover for symbol code.

AVIATION FLIGHT

AFLT104 **(1-4)**
Introduction to Aviation
Acquaints students with opportunities in aviation, such as mission flying, flight instruction, aircraft maintenance, avionics, sales, safety, and aerodynamics of flight. Non-majors receive one free hour dual instruction per credit hour enrolled. *Fall, Spring*

AFLT111 **(4)**
Private Pilot Ground School
Ground training to prepare students for the FAA private pilot airplane knowledge test. Topics include aerodynamics, weight and balance, Federal Aviation Regulations, navigation, meteorology, aircraft systems and performance. *Fall, Spring, Summer*

AFLT112 **(1-4)**
Private Pilot Flight Training
Flight and ground training to prepare students for the FAA private-pilot airplane practical test. Repeatable to 8 credits. *Fall, Spring, Summer*

AFLT202 **(2)**
Commercial Pilot Ground School
Ground training to prepare the student for the FAA commercial-pilot airplane knowledge test. Topics include advanced navigation, FAR Parts 61, 91, and 135 for air taxi, complex aircraft systems, weight and balance, and performance charts. *Fall, Spring, Summer*

AFLT203 **(2)**
Commercial Pilot Flight Training
Flight training and solo-flight practice to prepare the student for the FAA commercial-pilot airplane practical test. Repeatable to 4 credits. *Fall, Spring, Summer*

AFLT301 **(3)**
Instrument Pilot Ground School
Ground training to prepare the student for the FAA instrument-rating airplane knowledge test. Topics include Federal Aviation Regulations, meteorology, instrument flight charts, flight planning, instrument approaches, use of navigation equipment, and FAA publications relating to instrument flight. *Fall, Spring, Summer*

AFLT302 **(3)**
Instrument Pilot Flight Training
Instrument flight training to prepare the student for the FAA instrument-rating airplane practical test. Repeatable to 6 credits. *Fall, Spring, Summer*

AFLT307 **(2)**
Multi-Engine Flight Training
Flight and ground training to prepare the student for the multi-engine airplane practical test. *Fall, Spring, Summer*

AFLT315 **(3)**
Aircraft Systems for Pilots
The study of aircraft engines, propellers, and governors; the fuel, electrical, hydraulic, pneumatic, and de-icing systems, flight controls, weight and balance, and aircraft-instrument systems. *Fall*

AFLT330 **(1-3)**
Crew Resource Management
Study of the effective use of resources available to the crew to achieve safe and efficient flight operations. Areas include human factors, communication, conflict resolution, leadership, teamwork, and situational awareness as applied to flight operations. *Spring*

AFLT455 **(2)**
Flight Instructor Ground School
Ground training to prepare the student for the FAA flight-instructor airplane knowledge test. Topics include techniques of teaching, analysis of maneuvers, and lesson planning. *Fall, Spring, Summer*

AFLT456 **(2)**
Flight Instructor Flight Training
Flight and ground training to prepare the student for the FAA flight-instructor airplane practical test. Topics include the performance, teaching, and analysis of flight maneuvers required for the private and commercial airplane pilot. *Fall, Spring, Summer*

AFLT464 **(2)**
Basic and Advanced Ground Instructor
Prepares the student for the FAA basic and advanced ground-instructor knowledge test. Topics include techniques of teaching aerodynamics, aircraft performance, aircraft systems, weight and balance, meteorology, navigation, and regulations. *Fall, Spring, Summer*

AFLT465 **(2)**
Instrument Flight Instructor Ground School
Prepares the student for the FAA instrument flight-instructor knowledge test. Topics include techniques of teaching instrument flight, analysis of instrument maneuvers, instrument approaches, enroute operations, regulations, and lesson planning. *Fall, Spring, Summer*

AFLT466 **(2)**
Instrument Flight Instructor Flight Training
Flight and ground training to prepare the student for the FAA instrument flight-instructor airplane practical test. Topics includes the performance, teaching, and analysis of attitude instruments, instrument approaches, and enroute operations. *Fall, Spring, Summer*

AFLT467 **(2)**
Multi-Engine Flight Instructor
Flight and ground training to prepare the student for the FAA multi-engine airplane flight-instructor practical test. Topics includes the

performance, teaching, and analysis of maneuvers and procedures for the multi-engine airplane. *Fall, Spring, Summer*

AFLT469 **(2)**
Instrument Ground Instructor
Prepares the student for the FAA instrument ground-instructor knowledge test. Topics include the techniques of teaching advanced weather theory, weather reports and forecasts, instrument procedures and regulations, approaches, and enroute operations. *Fall, Spring, Summer*

AFLT474 **(3)**
Techniques of Mission Flying
Develops special piloting skills required in remote undeveloped bush operations. Topics include pilotage, dead reckoning, GPS navigation, low-level operations, terrain flying, mountain passes and canyons, cargo drops, short fields, uphill and downhill operations on primitive airstrips, maximum performance techniques, and precision airplane control. *Arranged*

AFLT485 **(3)**
Airline Transport Pilot Ground School
Prepares the student for the FAA airline transport pilot knowledge test. Topics include air-carrier or air-taxi regulations, high altitude weather, advanced weight and balance, and the performance and special problems in large airplane operations. *Fall, Spring, Summer*

AFLT486 **(3)**
Airline Transport Pilot Flight Training
Flight and ground training to prepare the student for the FAA airline transport pilot airplane practical test. Topics include instrument procedures, in-flight maneuvers, take-offs, landings, advanced airplane systems, and emergency procedures. *Fall, Spring, Summer*

AERONAUTICAL TECHNOLOGY

AVIA275/476 **(1-2)**
Topics in _____
Repeatable with different topics in aviation. *Arranged*

AVIA295 **(1-3)**
Cooperative Work Experience
Work experience with an aviation organization or airline. A minimum of 120 hours of work required per credit. Graded S/U. Prerequisite: Permission of department. *Arranged*

AVIA296/495 **(1-2)**
Independent Study
Enables students to pursue topics in aviation not offered in other scheduled courses. Prerequisite: Permission of the department. Repeatable to 4 credits. *Arranged*

AVIA395 **(1-2)**
Practicum
Lab or on-the-job experience to build skills in a specific area of aviation technology. Prerequisite: Permission of department. Repeatable to 4 credits. *Arranged*

AVIATION MAINTENANCE

AVMT108 **(4)**
Applied Science for Aerospace Technicians
Applies the sciences of mathematics and physics to the aerodynamics of flight, maintenance, weight and balance and various maintenance problems that the aircraft-maintenance technician could encounter. Includes the study and use of drawings and basic ground operations. *Fall*

AVMT114 **(2)**
Aircraft Basic Electricity
A study of the fundamental basics of electricity and electronics; including electrical diagrams, calculations, sources of electrical power, direct and alternating current, aircraft storage batteries, capacitance and inductance, binary code and the basics of solid state logic. *Fall*

AVMT116 **(2)**
Federal Regulation, Publications, Forms and Records
Study of the federal regulations and manufacturer publication as they apply to aircraft design, maintenance, inspections, forms and records, and the certification and privileges/limitations of the aviation maintenance technicians. *Fall*

AVMT120 **(4)**
Materials and Processes for Aircraft Structures
Includes hand-and-power tool usage, aircraft hardware and materials, precision measurements, corrosion control, non-destructive testing, and fluid lines and fittings. *Fall*

AVMT204 **Alt (2)**
Aircraft Electrical Systems
Practical study of aircraft electrical systems, including installation practices, repair, trouble shooting, service, inspections, and navigation and communication systems. *Spring*

AVMT206 **Alt (4)**
Powerplant Electrical Systems
A study of engine ignition and engine electrical systems (starter, generators, alternators, auxiliary electrical power units and their control circuits, engine instruments, and engine fire protection-suppression systems). *Spring*

AVMT210 **Alt (4)**
Aircraft Systems
A study into the inspection, repair, checking, servicing and trouble-shooting of the following aircraft systems; ice-and-rain detection, cabin atmosphere (pressurization, heating, cooling, and oxygen), position warning systems, fire detection and protection, and aircraft instruments and their use in troubleshooting of aircraft systems. *Spring*

AVMT220 **Alt (2)**
Aircraft Fuels and Fuel Systems
A study of the various types and handling of fuels used in aircraft. Includes a study of aircraft fuel systems, fuel-metering methods and the inspection, checking, servicing, troubleshooting, repair, and overhaul of fuel systems and their components. *Spring*

AVMT226 **Alt (2)**
Engine Fuel Metering Systems
A study of the engine side of the fuel systems (firewall forward). Includes a study of fuel-metering devices used on aircraft engines (carburetors, pressure carburetors, direct and continuous fuel-injection systems). Service, maintenance, repair and troubleshooting of each different system type is covered in detail. *Spring*

AVMT228 **(1-3)**
Maintenance: General, Airframe, or Powerplant Review
A review of all subjects from a selected curriculum. A minimum

of five examinations per curriculum area is required. Prerequisites: All applicable curriculum subjects must have been completed. *Fall, Spring*

AVMT237 **Alt (4)**
Aircraft Hydraulic, Pneumatic, and Landing Gear Systems
Operation and maintenance of aircraft hydraulic systems, pneumatic systems, landing-gear systems, and the inspection, checking, servicing, trouble-shooting, and repair of these systems and system components. *Spring*

AVMT304 **Alt (4)**
Aircraft Metal Structures
A study and application of the processes used in the fabrication and repair of aircraft metal structures. Welding theory and practice with emphasis on weld-quality identification. Riveted, aircraft, aluminum, sheet-metal structures including the fabrication and repair of such structures. *Fall*

AVMT306 **Alt (2)**
Aircraft Non-metal Structures
A study of wood and fabric as used in the construction of aircraft and a study of the methods, tooling, inspection, processes, and repair of composite aircraft structures. Includes the application, identification, and functions of aircraft protective finishes. *Spring*

AVMT308 **Alt (2)**
Aircraft Assembly, Rigging and Inspections
Study of the nomenclature and design features of both fixed-wing and rotor-wing aircraft and the assembly, alignment of aircraft structures, and rigging and balancing of control system. A detailed inspection of the entire aircraft or rotorcraft is covered as it applies to the airframe 100-hour and other required inspection. *Spring*

AVMT310 **Alt (4)**
Gas Turbine Engines
Principles and theory of jet-engine propulsion, design, types of, and associated systems. Maintenance, overhaul, installation-removal, repair, trimming, and troubleshooting of turbine engines. *Fall*

AVMT314 **Alt (3)**
Aircraft Propellers and Engine Inspections
Theory and limited work on propellers, both wood and metal. Encompasses fixed, adjustable, controllable, feathering, reversible, and the control of the latter by mechanical, hydromatic, or electrical control systems. Including the concept of the unducted fan, and the inspection practice of performing the 100-hour inspection on aircraft engines and propellers. *Spring*

AVMT316 **Alt (7)**
Reciprocating Engine Systems and Overhaul
A study of reciprocating engine theory, overhaul methods, and practices and the installation of reciprocating engines. Also includes a study of the following engine systems: exhaust, cooling, induction, and lubrication. *Spring*

AGRICULTURE

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Faculty
Thomas N. Chittick, *Chair*
Stanley Beikmann
Dale Birney
Katherine Koudele-Joslin
Ralph C. Wood

Academic Programs	Credits
BS: Agriculture	40
BS: Animal Science	40
Pre-Veterinary Medicine	
Management	
BS: Horticulture	40
Landscape Design	
Landscape/Turf Management	
BT: Agriculture	60
BT: Horticulture	60
Landscape Design	
Landscape/Turf Management	
AT: Agriculture	36
AT: Horticulture	35
Landscape Design	
Landscape/Turf Management	
Minors in Agriculture, Animal Science or Horticulture	20
Pre-Professional Program in Veterinary Medicine	

Programs

Bachelor of Science. The BS degree prepares individuals to pursue advanced degrees for careers in teaching or research. Students may major in agriculture, animal science or horticulture with a minor to complement their intended purpose.

Bachelor of Technology. The BT degree is a career specialist's degree. Graduates are prepared for supervisory and management positions in production agriculture, horticulture, or the ornamental horticulture industry.

Associate of Technology. The two-year AT degree programs provide students with adequate skills and working knowledge to apply for entry-level positions in their area of specialization.

BS: Agriculture

Major requirements—40
AGRI100, 118, 206, 300, 304, 308, 405; ANSI114; HORT105, plus 13 major elective credits chosen in consultation with advisor.
Cognate requirements—18
BIOL165,166; CHEM131, 132