AVIATION (AVM)

AVM 100 - Introduction to Aviation Management (3 Credits)
3 lecture, 0 lab, 3 total contact hours
Provides students with the academic knowledge necessary to oversee departments of airlines and airports, learn about aviation laws, regulations and various aspects of aviation management. This course requires independent research and also focuses on the application of business principles for airport and aviation management.

AVM 101 - Aircraft Blueprint Reading (3 Credits)
3 lecture, 0 lab, 3 total contact hours
Reviews the theory and application of blueprint reading. Includes the types of aircraft drawings, measuring tools, and layout equipment; reference lines, drawing formats, manufacturing codes, hardware and materials. Includes production of aircraft sketches, drawings, graphs, charts, usage of aircraft schematics, assembly and exploded diagrams. Prerequisite: MTH 100 with a grade of C or better or concurrent enrollment.

AVM 107 - History of Aviation (3 Credits)
3 lecture, 0 lab, 3 total contact hours
This course is designed to give the students a historical perspective of the major events leading up to the modern air transportation industry. It provides a chronological review of the history of aviation beginning with the first balloon flight in 1783 continuing through the development of the modern turbofan jet transport airplane. This course covers the advancement of aircraft through the technological research by the military and space flight developments.

AVM 111 - Aircraft Electrical Systems (3 Credits)
2 lecture, 2 lab, 4 total contact hours
Provides the framework of aircraft electricity. Includes the study of matter, electron theory, current/electron flow, direct and alternating current, Ohm's Law, Kirchoff's laws, circuit elements, use of testing equipment, and electrical calculation and measurements. Includes interpretation of schematics and other writing diagrams, battery theory and maintenance, aircraft electrical systems, and introduction to communication and navigation radio systems. Incorporates the study of aircraft airframe electrical components as well as airframe and powerplant electrical systems. Prerequisite: MTH 100 with a grade of C or better or concurrent enrollment.

AVM 112 - Aviation Security Management (3 Credits)
3 lecture, 0 lab, 3 total contact hours
Reviews aviation security personnel practices and processes to coordinate and implement the application of airport security preventive measures that align with FAA regulatory requirements. Provides a detailed analysis of effective procedures including situational awareness, teamwork, and effective communication and policies to prevent the intentional sabotage of aviation systems.

AVM 130 - Aircraft Propellers (3 Credits)
1 lecture, 4 lab, 5 total contact hours
Reviews the basics of aircraft propellers. Includes propeller theory, nomenclature, types, construction, and installation and maintenance. Also includes constant speed systems, feathering systems, reversing systems, icing systems, synchronizing systems, and un-ducted fans. Prerequisite: AVM 101 with a grade of C or better.

AVM 155 - Aviation Physics (3 Credits)
1.5 lecture, 3 lab, 4.5 total contact hours
Reviews the principles of hydraulic power. Includes basic physics, mechanical, heat and fluid dynamics. Addresses basic aerodynamics, fabrication and installation of fluid lines and fittings, laws of motion, and other aircraft nomenclature. Prerequisite: MTH 100 with a grade of C or better or concurrent enrollment.

AVM 160 - Materials and Processes (3 Credits)
1.5 lecture, 3 lab, 4.5 total contact hours
Reviews the use of metallic and non-metallic structural materials for comparison of their structural properties. Includes metal processing, heat treatment, structural materials, heat treatment of alloys or limited use metals, non-destructive testing and/or inspection, corrosion, corrosion-prone areas, and corrosion control. Covers steel, aluminum and limited-use metals, processes and materials for corrosion control, aircraft cleaning, and aircraft cleaning agents. Prerequisite: MTH 100 with a grade of C or better or concurrent enrollment.

AVM 201 - Aviation Safety, Rules and Regulations (3 Credits)
1 lecture, 4 lab, 5 total contact hours
Reviews personal safety concerns human factors, accident avoidance, facility fire protection, use and handling of hazardous materials, ramp procedures and the securing and servicing of aircraft and ramp support equipment. Includes forklift training and certification. Reviews Federal Aviation Administration (FAA) regulatory requirements. Includes certification of aircraft and components, FAA regulations for aircraft maintenance, manufacturing standards, inspection requirements, mechanic certification, FAA publications, maintenance publications and aircraft logs. Prerequisite: MTH 100 with a grade of C or better or concurrent enrollment.

AVM 203 - Aviation Career Preparation (3 Credits)
3 lecture, 0 lab, 3 total contact hours
Reviews the roles, requirements and responsibilities necessary for a career in the aviation industry. This includes aviation managers, freight managers, vendor leadership managers, safety managers, facilities managers, airline managers, maintenance technicians, and numerous other positions that are vital to effective and efficient daily operations of the aviation industry. This course will also cover the history of the Chicago Department of Aviation, aviation terminology, FAA regulations and current career opportunities and employment trends in the industry.

AVM 209 - Weight and Balance (3 Credits)
1 lecture, 4 lab, 5 total contact hours
Covers preparation of aircraft for weight and balance. Includes service and maintenance manuals, type certificate data sheets, standard weight and balance practices, weighing an aircraft, calculating center gravity, and correction of out of balance conditions. Includes addition and subtraction of equipment, equipment lists, flight manual updates, control surface balancing, identification and selection of standard hardware, installation and assembly of specialty hardware, and use of precision measuring equipment. Prerequisite: MTH 100 with a grade of C or better or concurrent enrollment.

AVM 211 - Aviation Management II (3 Credits)
3 lecture, 0 lab, 3 total contact hours
This course provides an in-depth analysis of the airline characteristics, scope and economics focusing on airline management technical tools and management functions. Provides an historical perspective of the US airlines, air transportation and regulators and associations. Familiarizes students with the US airline industry, management, organization and studies forecasting methods, marketing, scheduling, fleet planning, financing and labor relations. Further examines management functions of planning, organizing and directing with a focus on airline management. Prerequisite: AVM 100 with a grade of C or better.

AVM 214 - Aviation Safety Management and Regulations (3 Credits)
3 lecture, 0 lab, 3 total contact hours
Reviews the principles and regulatory practices of commercial aviation safety in the United States and throughout the world. Addresses the regulatory information provided by the International Civil Aviation Organization and Safety Management Systems (SMS) that is critical to aviation safety. Prerequisite: AVM 112 with a grade of C or better.

AVM 215 - Alternate Structures (3 Credits)
2 lecture, 2 lab, 4 total contact hours
Conducts aircraft structural fabrication using wood, tube steel and fabric processes and techniques. Includes structural types, wood and welded tube steel fabrication methods, welding of typical metals used in aircraft construction, fabric covering processes, inspection and maintenance, typical repair procedures, and aircraft finishings Prerequisite: MTH 100 with a grade of C or better or concurrent enrollment.

AVM 219 - Engine Electrical Systems (3 Credits)
2 lecture, 2 lab, 4 total contact hours
Examines inspection, repair, and modification of engine electrical systems. Includes magnetos (components, tooling, wiring, and drives), ignition switches, ignition harness, ignition booster system, spark plugs, engine ignition analyzers, turbine engine (ignition transformers and igniter plugs), engine electrical controls (switches, fuses and circuit breakers, circuits, wiring, installation, and engine bulkhead), and technical data manuals and catalogs. Prerequisite: AVM 101 and AVM 201 with grades of C or better.

AVM 220 - Hydraulic and Pneumatic Power (3 Credits)
1 lecture, 4 lab, 5 total contact hours
Examines hydraulic and pneumatic system components. Includes system operating principles, fluids, pressures, hydraulic powered flight controls, landing gear, braking and accessory power systems, pneumatically powered or assisted accessories, and system and component inspection servicing repairs. Prerequisite: MTH 100 with a grade of C or better or concurrent enrollment.

AVM 221 - Air Traffic Control Systems (3 Credits)
3 lecture, 0 lab, 3 total contact hours
This course outlines the development of the Air Traffic Control (ATC) system along with many of the FAA rules and regulations governing visual and instrument flight. It includes a review of the intricate procedures, rules, systems and phraseology used today for controlling air traffic and provides a brief look at future requirements in the domestic and international arena. Prerequisite: AVM 222 with a grade of C or better.

AVM 222 - Airport Planning and Management (3 Credits)
3 lecture, 0 lab, 3 total contact hours
Reviews varying aspects of airport infrastructure, from the airfield and runway to airspace, air traffic control, and terminal and security systems. Thoroughly addresses the FAA's National Plan of Integrated Airport Systems (NPIAS), historical and current legislation and regulations, FAR Part 139. Students will explore cutting-edge concepts such as automation, smart baggage handling, enhanced security, and analytics. Prerequisite: AVM 100 with a grade of C or better.

AVM 223 - Airframe Inspection (3 Credits)
1.5 lecture, 3.5 lab, 5 total contact hours
Engages in conformity inspections of airframes. Includes inspections of incoming spare parts and stock items, airframe and equipment conformity inspections, airframe and systems airworthiness and conformity inspections, conformity inspections of installed equipment, annual and 100-hour inspections of small aircraft, including research of all pertinent inspection documents, service or maintenance manuals, type certificate data sheets, airworthiness directives, service bulletins and additional instructions for continued airworthiness, inspection procedures for large aircraft work orders, and non-routine job cards used by local aviation maintenance companies. Prerequisite: AVM 101 with a grade of C or better.

AVM 225 - Engine Air Flow Systems (3 Credits)
1 lecture, 4 lab, 5 total contact hours
Addresses fundamentals of engine air flow systems. Includes reciprocating engine induction systems, alternate induction air systems, induction systems maintenance, superchargers, turbochargers, turbo compound systems, reciprocating engine exhaust systems, exhaust subsystems, exhaust system maintenance, reciprocating engine cooling, turbine engine induction systems, turbine engine cooling, turbine engine exhaust systems, turbine engine exhaust systems maintenance, and turbine engine airflow subsystems. Prerequisite: AVM 101 and AVM 201 with grades of C or better.

AVM 226 - Aircraft Maintenance Management (3 Credits)
3 lecture, 0 lab, 3 total contact hours
A comprehensive overview of the structured aircraft maintenance and engineering programs established by the aircraft manufacturer and certified by the Federal Aviation Administration for civil aviation. Areas of emphasis include maintenance program development, maintenance documentation, the role of engineering, maintenance, maintenance support, quality control, reliability and safety within the program.

AVM 227 - Atomospheric Controls (3 Credits)
1.5 lecture, 3 lab, 4.5 total contact hours
Examines atmospheric controls and its elements that are of concern to flight. Includes control systems; types of operations and maintenance; and physiological requirements for flight crews, passengers, and the human support systems. Includes oxygen systems; cabin pressurization system and operations; and safety and maintenance requirements. Prerequisite: MTH 100 with a grade of C or better or concurrent enrollment.

AVM 229 - Reciprocating Engine Overhaul (3 Credits)
1 lecture, 4 lab, 5 total contact hours
Reviews basic aircraft reciprocating engine overhaul. Includes engine components, wrist pins, connection rods, crankshafts, case, cam shafts, lifters, valves, push rods and tubes, rocker assemblies, accessories, lubrication, overhaul options, overhaul credentials, overhaul procedures, reassembly after overhaul, engine installations, engine break-in, and test cell procedures. Prerequisite: AVM 219 with a grade of C or better.

AVM 230 - Fuel Systems (3 Credits)
1.5 lecture, 3 lab, 4.5 total contact hours
Examines the theory and application of fire, ice, rain and fuel systems. Includes fire detection terms, extinguishing and protection systems, smoke detection, fire warning, and fire extinguishing system components used. Investigates how systems function, inspection testing and maintenance, ice and rain protection terms, formation and conditions for icing of aircraft, ice and rain detection, protection systems components, functions, inspection and maintenance, fuel systems terms, safety systems requirements, fuel tank types and construction indicating, fueling, and defueling inspection and maintenance. Prerequisite: MTH 100 with a grade of C or better or concurrent enrollment.

AVM 232 - Civil Aviation (3 Credits)
3 lecture, 0 lab, 3 total contact hours
Reviews the three major categories of aviation: Commercial air transport, focuses on scheduled and non-scheduled passenger and cargo flights. Aerial work focuses on aircraft that is used for specialized services such as photography, surveying, agriculture, and search and rescue. General aviation addresses all other civil, private and or commercial flights. This applies to both national and international aviation. Prerequisite: AVM 222 with a grade of C or better.

AVM 234 - Aviation Human Factors and Safety (3 Credits)
3 lecture, 0 lab, 3 total contact hours
Focuses on human factors including all sensory, perceptive, cognitive and decision-making dynamics as they are expressed in aviation. Addresses aviation safety including incidents, accidents, crew resource management and performance. Prerequisite: AVM 112 with a grade of C or better.

AVM 235 - Engine Support Systems (3 Credits)
1 lecture, 4 lab, 5 total contact hours
Examines theory and application of support systems for gas turbine engines. Includes fire protection, fire detection systems, fire extinguishing agents and systems, and fire detection and extinguishing system maintenance. Also includes turbine engine pneumatic systems, pneumatic starting systems, thrust reversers, auxiliary power units, turbine engine removal and installation, and engine storage and transport. Prerequisite: AVM 111 and AVM 201 with grades of C or better.

AVM 237 - Engine Fuel Metering and Operation (3 Credits)
1 lecture, 4 lab, 5 total contact hours
Examines fundamentals of aircraft fuel systems. Includes fuel metering theory and requirements, aviation fuels, float type carburetion, float carburetor maintenance and installation, and pressure carburetor maintenance and installation. Also includes fuel injection systems, Bendix fuel injection and maintenance, and Teledyne Continental Motors (TCM) fuel injection and maintenance. Also includes fuel metering system components and maintenance, turbine engine fuel systems components and maintenance, jet fuel controls; and reciprocating, turbine, and turbo propeller engine operations. Prerequisite: AVM 219 with a grade of C or better.

AVM 239 - Transportation Labor Relations (3 Credits)
3 lecture, 0 lab, 3 total contact hours
Reviews the labor-management relations in the aviation industry and evaluates contemporary labor issues. Topics and issues are addressed focusing on the larger scope of labor-management relations and with developments in labor as a consequence of deregulation. The institutional framework of collective bargaining and promoting industrial peace are also addressed. Prerequisite: AVM 211 with a grade of C or better.

AVM 245 - Turbine Engines (3 Credits)
1 lecture, 4 lab, 5 total contact hours
Reviews basic gas turbine engine and turbo propeller component makeup and repair. Includes inspection, servicing, and repairs performed on engine components: compressor, diffuser, combustion, accessory drive, and lubricating system. Also includes a reassembly overhaul. Prerequisite: AVM 219 with a grade of C or better.