AVIATION SCIENCE (AVS)

AVS 1013 Aviation Electric and Magnetic Fundamentals (3-1-3)
Covers mathematical and physical concepts that are essential for cadets in the field of aviation. Basics of the following topics are covered: vibrations and waves motion, thermodynamics, electricity, magnetism, digitalization, and miniaturization.
Prerequisites: AHM 1203, LSM 1103

AVS 1023 Aviation Calculus (3-1-3)
Presents the basic calculus concepts required for the student of aviation. Topics include differentiation and integration of algebraic functions; applications to velocity, acceleration, area, work done by a force, curve sketching and computation of extreme values.
Prerequisites: LSM 1103

AVS 2113 Meteorology I (2-2-3)
This course is devoted to basic meteorological knowledge essential to understanding the effect of weather on flight. Student pilots study the structure of the atmosphere, temperature, pressure, wind, clouds, stability, air masses, fronts, thunderstorm. The course also includes lab activities designed to reinforce the theoretical concepts.

AVS 2123 Principles of Flight (3-1-3)
A study of principles of flight fundamentals and theory at the technical level. This course includes history of flight, major aircraft components, basics of aerodynamics, aerodynamic lift, drag, stalling and high speed aerodynamics.
Prerequisites: AHM 1203, LSM 1103

AVS 2133 Aircrew Survival (2-2-3)
The course covers all the four principles of survival in detail. All geography conditions are considered, with an emphasis on survival in UAE environments of desert and sea. The course details aviation survival equipment and cadets carry out wet dinghy drills.

AVS 2143 Aircraft Systems and Components (2-2-3)
Details the construct and systems of aircraft, examining aircraft structures, hydraulic systems, pneumatic systems, ice protection systems, air conditioning and pressurization systems, oxygen systems, fire protection systems, landing gear and fly-by-wire control systems.
Prerequisites: AHM 1203, LSM 1103

AVS 2153 Radar Systems (3-1-3)
Designed to provide cadets with the basic concepts of the radar theory and the operating principles of the ground and airborne radar systems. The course provides cadets with information on classic and modern Radar technologies and calculations. The course then extends to discuss processing the signals provided by radar to convert them into data and information, and then concludes by reviewing various types of radar data displays.
Prerequisites: AHM 1203, AVS 1013

AVS 3003 Avionics (2-2-3)
Introduction to the basic concepts, terminology, and theory of electronics and communication systems. Details of ground based and airborne avionics systems, their technologies and use. Systems covering include communications, radio navigation aids, satellite navigation aids, radar, aircraft computers and data buses.
Prerequisites: AVS 1013, LSM 1103

AVS 3013 Instruments (2-2-3)
The instruments covered by this course are treated in general terms. This course deals with aircraft attitude and flight path instruments, aircraft systems'' monitoring instruments and navigation and aircraft management instruments including glass cockpit and multi-function displays. The course also covers instruments for engine and other aircraft systems.
Prerequisites: AHM 1203, AVS 1013, LSM 1103

AVS 3023 Aero Engines (3-1-3)
Provides information on the construct and operation of aircraft propulsion systems. Areas of study include reciprocating, gas turbine engines and electric propulsion, fuel and engine systems, gearing systems, accessories and propellers & rotors. Detail is also provided of thrust augmentation and control systems including: thrust reversal, thrust vectoring and afterburner.
Prerequisites: AHM 1203, LSM 1103

AVS 3033 Navigation (2-2-3)
Students are shown how to prepare a navigation plan and carry out navigation in the air using maps and charts. Details of physical, time and geographic factors effecting navigation planning are provided, and students are taught which maps or charts to select. Students prepare a medium level navigation plan using navigation instruments.
Prerequisites: LSM 1103

AVS 3042 Meteorology II (2-1-2)
Provides instruction on meteorological effects that represent hazards to air operations and reporting data specifically relevant to aircrew. Students are taught to interpret and use meteorological reports, forecasts and charts to be able to prepare and plan for flight operations evaluating the weather conditions.
Prerequisites: AVS 2113

AVS 3043 Satellite Communications and Navigation Systems (3-1-3)
This course is designed to explain the concepts, terminologies, and applications of satellites. The aim of this course is to acquire the knowledge and skills related to satellite principles. The contents of this course are divided into two parts; in the first part, an emphasis is placed on fundamentals of satellites terminologies, orbital parameters, satellite's subsystems, and satellite communication techniques. The second part introduces the applications of satellites in real life such as communication satellites, weather satellites, military satellites and navigation satellites.

AVS 3053 Electrical Systems (2-2-3)
Introduction to the basic concepts, terminology, and theory of electricity, magnetism and electronics. Details of ground based and airborne avionic electronic systems, their technologies and use. Systems covering include communications, radio navigation aids and satellite navigation aids, electrical power, radar, guidance and control systems.
Prerequisites: AVS 1013, LSM 1103

AVS 3103 Airmanship (2-2-3)
Covers basic Aviation Terminology, important Rules and Procedures, knowledge about Airport and Air Traffic Control System. This study improves cadets' sense of safe flying or 'Airmanship'. The students also visit Air Traffic Control Tower, Runway, Airport Lights, Navigation Aids and training aircraft.

AVS 3113 Aviation Safety (3-1-3)
Aviation Safety is perhaps the closest to heart subject for the students. As future fighter pilots of the air force, which is certainly a high stress profession with its inherent risks, students must be convinced that a traditionally risky job can also be performed safely with the least loss of life and resources. Obviously, a delicate balance has to be maintained between operational flying and aviation safety.
Prerequisites: AVS 3103

AVS 3123 Advanced Navigation (2-2-3)
The course provides the students with advanced navigation techniques that can be used for airways, low-level and tactical navigation. Students are taught various methods for managing the flight path so as to meet the navigation plans. Students are also introduced to modern Global Navigation Satellite Systems (GNSS) and other collision avoidance systems like Automatic Dependent Surveillance Broadcast (ADS-B) and Flight Alarm System (FLARM).
Prerequisites: AVS 3033

AVS 3133 Aircraft Performance: Aeroplane (2-2-3)
The focus of this course is on aerodynamic performance of aircraft powered by reciprocating, turboprop, or jet turbine engines. The course includes aircraft performance curves, straight and level performance, climbing performance, descending performance, turning, take-off and landing performance, spinning, stability and control, and weight and balance.
Prerequisites: AVS 2123, AVS 2143

AVS 3143 Human Factors (3-1-3)
Students will examine the concept of human factors and their effect on human performance. The course demonstrates the importance of human factors and analyzes its effects on error prevention, safety and mission effectiveness in aviation operations. The concepts of situational awareness, decision making process, risk management, risk assessment and the effects of workload, fatigue, stress and physical fitness on human performance are covered. Students are introduced to the concepts and practices of team process, leadership and crew resource Management (CRM).
Prerequisites: AHM 1203

AVS 3153 Electronic Warfare Systems (3-1-3)
Provides students with a general overview of the principles, concepts and general scope of Electronic Warfare. The types or categories of Electronic Warfare and details of systems used to carry out the categories are studied, to include Electronic Attack (Electronic Counter-Measures), Electronic Protection (Electronic Counter Counter-Measures) and Electronic Support (Electronic Support Measures).
Prerequisites: AVS 1013, AVS 3053

AVS 3163 Helicopters : Principles of Flight (2-2-3)
The course is designed for ab-initio helicopter trainee pilot cadets of UAE Air Force at Khalifa Bin Zayed Air College. It builds upon the general aerodynamic information covered in the principles of flight of aircraft. The cadets will gain knowledge about major helicopter components, rotor dynamics, flying controls, hover, horizontal flight, forward flight, auto-rotation, critical emergencies & recovery actions.
Prerequisites: AVS 2123

AVS 3173 Missile Systems (2-2-3)
Provides students with details of how air and ground based Air Defence missiles are designed and used. The technical specifications of the equipment, the payload, armament, propulsion, guidance and control systems are reviewed. Students then determine which Missile assets to use to establish a defence against a given air defence threat.
Prerequisites: AHM 1203

AVS 3193 Aviation Law (3-1-3)
This course provides the student with a thorough grounding in the international and national legal aspects of aviation, covering air law, international agreements and policies, air navigation services and aerodrome configuration and management.

AVS 4003 Helicopter Performance (3-1-3)
The Helicopter Performance course is designed for ab-initio helicopter trainee pilot cadets of UAE Air Force at Khalifa Bin Zayed Air College. It builds upon the aerodynamic information covered in the Helicopters : Principles of Flight. Through this course, the cadets will gain knowledge about the major factors that affect the performance of a helicopter in different flight conditions such as hover, climb, level flight & autorotation. The cadets will also understand the weight and balance of a helicopter. The course material is largely modeled on Bell 407 helicopter used for training at KBZAC.
Prerequisites: AVS 3163

AVS 4012 Aviation Physiology (2-1-2)
Provides students with the effects of flying on pilot"s body, precautions and remedies for the physiological and psychological problems experienced by pilots. Hypoxia, hyperventilation, spatial disorientation, vision, physiology of ejection, effects of drugs alcohol and carbon monoxide on flying are included. Motion and decompression sickness, fatigue and effects of acceleration, description of the first-aid and good nutrition are also treated.
Prerequisites: AVS 3143

AVS 4143 Capstone Project (3-1-3)
Facilitates the steps in the development of a research project that culminates in a research proposal. Introduces concepts associated with defining a research question/problem statement, developing and testing a hypothesis; gathering information, perform data analysis and interpretation of key findings that reveal the implications to the Aviation/Aerospace industry or Military environment. A formal report (abstract/introduction, problem statement, hypothesis, literature review, methodology, data analysis, and findings) followed by a presentation of the findings are required.
Prerequisites: LSS 1123