

# AVIATION SCIENCE (AVS)

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## **AVS 1013 Aviation Electric and Magnetic Fundamentals (3-1-3)**

Provides education in the fundamental physics behind some of the key technologies found in aviation systems. The course primarily focuses on Electricity, Magnetism and the basic physics behind electrical systems. However, there is an additional small section on wave motion and thermodynamics.

**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 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, icing, turbulence, visibility and fog. The course also includes lab activities designed to reinforce the theoretical concepts

## **AVS 2123 Principles of Flight (2-2-3)**

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 Survival (2-2-3)**

Covers principles of survival in a hostile environment. 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 (2-2-3)**

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 students 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 (3-1-3)**

Introduction to the basic concepts, terminology, and theory of electronics and communication systems. 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 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 (2-2-3)**

Provides information on the construct and operation of aircraft propulsion systems. Areas of study include piston and gas turbine engines, 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 (1-2-2)**

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, charts and forecasts to prepare and plan for flight operations.

**Prerequisites:** AVS 2113

## **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 (2-2-3)**

Students are introduced to the requirements of safety at work for aviation and the concepts of a safety culture to reduce aviation risks and improve performance. Students are shown how to identify hazards to safety on aircraft and airfields and how to prepare safety briefings and safety reports. Students are shown how aircraft maintenance contributes towards 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 techniques for managing the flight path so as to meet the navigation plans.

**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 (2-2-3)**

Students will examine the concepts behind human factors and their effect on human performance. The course demonstrates the importance of human factors and discusses its effects on safety, effectiveness and improvement of the aviation industry. The concepts of situational awareness, decision making and the effects of workload, fatigue, stress and physical fitness on human performance are covered. Students are introduced to the concepts and practices of Crew Resource Management.

**Prerequisites:** AHM 1203

**AVS 3153 Electronic Warfare Systems (2-2-3)**

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 Warfare Counter-measures) Electronic Protection Measures (Electronic Warfare Counter Counter-measures) and Electronic Warfare Support (Electronic Support Measures).

**Prerequisites:** AVS 1013, AVS 3053

**AVS 3163 Principles of Flight: Helicopter (2-2-3)**

The focus of this course is a study of principles of flight specific to a rotary wing aircraft (helicopter). It builds upon the general aerodynamic information supplied in Principles of Flight by providing information on the aerodynamics of the rotating wing, the blades of the wing, and the usual aerodynamics of rotary wing forward moving flight and rotary wing hovering flight

**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 Aircraft Performance: Helicopter (2-2-3)**

The focus of this course is on aerodynamic performance of fixed wing and rotary aircraft, with the primary emphasis being on helicopter performance. 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 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 4123 Capstone Project I (1-3-3)**

Facilitates the first steps in development of a research project and culminates in a research proposal. Introduces concepts associated with defining a research question\problem statement, developing and testing a hypothesis, gathering information, and data analysis. Students develop a research proposal outlining the steps to complete research on an aviation/aerospace topic.

**Prerequisites:** LSS 1123

**AVS 4133 Capstone Project II (1-3-3)**

Builds upon the research proposal. Data gathering, analysis, and interpretation of findings are key elements. The focus is on the results of the research: Interpret the findings and reveal the implications to the Aviation/Aerospace industry? A formal report (abstract, problem statement, hypothesis, methodology, data analysis, and findings) to include a presentation are required.

**Prerequisites:** AVS 4123