

# Course Catalog

## I. General Studies Courses

### Humanities (HUM)

#### 1. HUM-1011 Islamic Culture (3 CR)

This course introduces some of the basic study skills needed for success at college level in technical areas. It highlights the problems and challenges facing humanity in general, and Arabic and Islamic nations in particular. Pre-requisite: None. Co-requisite: None.

#### 2. HUM-1012 Emirati Society and Culture (3 CR)

This course aims to strengthen the sense of national belonging, loyalty and pride through consolidation of national culture and social concepts, by student participation in a research project during the semester covering all topics associated with the course. Pre-requisite: None. Co-requisite: None.

#### 3. HUM-1013 Arabic Communication Skills

This course aims to develop students' capabilities in listening, reading, writing and speaking in their native language. Students will navigate through a variety of texts from the Quran, poetry, prose and short stories. Pre-requisite: None. Co-requisite: None.

### English (ENGL)

#### 4. ENGL 1011 Academic English I (3 CR)

This course is a study of safety and health management in the workplace as it related to hazard identification and control, accident investigation and prevention, emergency planning and moral responsibilities to society. It introduces the students to profession, professional ethics, various moral issues and uses of ethical theories, and codes of ethics in professional engineering societies. Pre-requisite: Completion of ENGL 1001. Co-requisite: None.

#### 5. ENGL-1012 Academic English II (3 CR)

This course focuses on developing students' language skills in technical communication genres. It is designed to introduce students to information and language specifically for future technical careers. It focuses on units covering design and innovation, manufacturing techniques, frameworks, control systems, engine and fuel systems, as well as safety and emergency. Pre-requisite: ENGL 1011. Co-requisite: None.

#### **6. ENGL 2011 Public Speaking (1 CR)**

This course prepares students for situations where public speaking is required. Through an e-learning approach to learning, this course will help students practice and develop effective communication skills to compose and present speeches appropriate to various audiences, purposes and occasions. Pre-requisite: Completion of ENGL 1012. Co-requisite: None.

#### **7. ENGL 2012 Literature Review (1 CR)**

The overall objective of this course is to equip learners with the skills in locating, identifying and selecting credible sources of information, navigating the structure of research articles, compiling an annotated bibliography and a structured literature review. Pre-requisite: Completion of ENGL 1012. Co-requisite: None.

#### **8. ENGL 2013 Report Writing (1 CR)**

This course enables learners to refine their writing skills in the genre of report writing through an online learning approach. Students will learn about key principles of report writing through a mixture of synchronous and asynchronous classes and workshops. Pre-requisite: Completion ENGL 1012. Co-requisite: None.

### Mathematics (MATH)

#### **9. MATH-1001 Pre-calculus (3 CR)**

This course covers basic algebraic operations on numbers, exponents, roots and radicals, equations, inequalities, scientific notations, algebraic operations on expressions, solving formulas and literal equations. It also covers geometry, functions and its graphs, solving system of linear equations and quadratics equations algebraically and graphically, matrix, solving linear, factoring and fractions, exponents and radicals, solving logarithmic and exponential equations, trigonometry, radian measure, vectors and oblique triangles, law of sines and law of cosine, plotting trigonometric functions. Pre-requisite: None. Co-requisite: None.

#### **10. MATH-1011 Calculus I (3 CR)**

This course covers introduction to single variable calculus. It includes topics limits and continuity, derivatives of algebraic, trigonometric, exponential, logarithmic and transcendental functions, implicit differentiation, techniques of differentiation and applications of the derivative in optimization, engineering applications and sketching graphs, L'Hospital rule, the concept of antiderivative and integral, definite and indefinite integrals, fundamental theorem of calculus, simple integration techniques, applications of integration in engineering and geometry. Pre-requisite: MATH 1001. Co-requisite: None.

## Natural Science

### **11. PHYS 1015 Physic I for Aviation (3 CR)**

This course enables students to develop their skills in understanding physical concepts. It helps students approach questions in a logical and systematic manner. This course covers a variety of topics in mechanics that are relevant for the degrees offered at the polytechnic. Pre-requisite: None. Co-requisite: MATH 1001, PHYS 1016

## Fundamental Engineering

### **12. ICT-1011 Introduction to Programming and Problem Solving (3 CR)**

This course covers the fundamentals of computer programming and its underlying principles using the Java programming language. Concepts and methods are illustrated by examples from various engineering disciplines. Useful numerical techniques and their applications to real world problems in science and engineering are also discussed. Pre-requisite: None. Co-requisite: None.

## General Requirements skills for life

### **13. HUM 3011 Creativity, innovation, and entrepreneurship (3 CR)**

This course will provide you with the skills and tools to develop and implement innovative ideas. Through real world examples and research from experts in the field, you will learn how to incorporate innovation into your daily work as engineers in UAE industries. In addition, you will explore creative and innovative ways to make these same industries prosper locally and become competitive globally. Working in teams, you will present a project showcasing an original idea or concept that would benefit UAE industries, while following ethical-decision making processes and civic responsibility in regards to innovation and entrepreneurship. Pre-requisite: None. Co-requisite: None.

## General Courses Required for Aircraft Maintenance

### **1. AMEM 1301 Human Factors – EASA (3 Cr.)**

This course is designed with the intention to improve the level of human factors awareness and to improve the understanding of human performance issues related to activities in a maintenance environment. Topics covered also include social physiology, physical environments, tasks, communication and hazards in the workplace. Pre-requisite: None; Co-requisite: None.

## **2. AMEM 2201 Aviation Legislation – EASA (2 Cr.)**

This course is designed to provide students with a working knowledge of aviation legislation to enable maintenance work to be done within the requirements of the Law. This course covers international regulatory framework from the United Nations to national level including the role of ICAO, CAR -66 (Certifying Staff-Maintenance) and CAR-145 (Approved Maintenance Organisation), the purpose of the documents required under aircraft certifications, the continuing airworthiness of the aircraft, approved maintenance organisations and the Continuing Airworthiness Management Organisations (CAMO). Pre-requisite: ENGL 1012; Co-requisite: None.

## **II. Core Courses**

### **Aircraft Maintenance courses (CAT A)**

## **3. AMEM 1202 Maintenance practice I-Cat A (2 Cr.)**

The objective of this course is to develop students understanding and skills on the safety precautions and testing as part of EASA module 7 Cat A. This course covers safety precautions for aircraft and workshops, workshop practices, care and control of tools. Pre-requisite: None; Co-requisite: None.

## **4. AMEM 1201 Materials and Hardware- Cat A (2 Cr.)**

This course covers the characteristics of ferrous, non-ferrous, metallic, non-metallic and composite materials, properties and application of sealant and bonding agents, wooden structure and fabric covering. The course also covers various types of corrosion: methods of detection and treatment; aircraft fasteners, their specifications and how they are applied in aircraft technology; pipes and unions, springs, bearings, transmission and aircraft control cables and end fittings; cable systems components, Bowden cables and aircraft flexible control systems; construction and characteristics of aircraft electrical cables and connectors. Pre-requisite: PHYS1015; Co-requisite: AMEM1206

## **5. AMEM 2102 Basic Aerodynamics (Cat A) (2 Cr.)**

The course covers the characteristics of atmosphere; and basic aerodynamics including: the airflow around a body, airfoil sections, and the aerodynamic forces acting on the aircraft, lift generation and different types of drag. The course also includes theory of flight: the aerodynamic forces and aircraft stability and lift augmentation devices. Pre-requisite: Pre-requisite: PHYS1015; Co-requisite: None.

## **6. AMEM 2104 Aircraft Systems and Components I- Cat A (3 Cr.)**

This course covers fundamentals of aero-plane theory of flight and flight controls, high speed flight, the airworthiness requirements of structural strength, the aircraft component and their construction, aircraft pressurization and air-conditioning systems, aircraft equipment and furnishings. The course also includes: hydraulic power, pneumatic systems, fire protection system, landing gear, ice protection system, fuel system and water and waste system. Pre-requisite: AMEM 1201, AMEM 2102; Co-requisite: None.

#### **7. AMEM 2105: Gas Turbine Engines Cat A (3 Cr.)**

The course covers: gas turbine engines fundamentals, construction and working principles; gas turbine engine components: inlet section, compressors section, combustion chamber, turbine section, and exhaust section; gas turbine engine systems: starting, fuel, oil, cooling and indication systems. The course also covers safety procedures, monitoring systems, engine ground operation, and thrust augmentation systems. Pre-requisite: PHYS 1011, AMEM 2102; Co-requisite: AMEM 2107

#### **8. AMEM 2103: Maintenance Practices II - Engineering Drawings- Cat A (2 Cr.)**

This course covers introduction to engineering drawings, diagrams and standards, ATA 100 specifications, common systems of fits and clearances, electrical cables, standard methods of checking aircraft parts. Pre-requisite: None; Co-requisite: None.

#### **9. AMEM 2202 Maintenance Practices III - Electrical Cables and Connectors- Cat A (2 Cr.)**

This course covers fundamental knowledge of electrical cables, connectors, and wiring protection methods, crimping tools connector pin, coaxial cables, wiring protection technique. The course also covers safetying of aircraft fasteners and electrical systems hardware. Pre-requisite: AMEM 1202; Co-requisite: AMEM 2206.

#### **10. AMEM 2203 Maintenance Practices IV- Aircraft Parts Joining and Inspection- Cat A (2 Cr.)**

The objective of this course is to develop students understanding and skills on aircraft maintenance practice part IV of EASA Cat A module 7. This course covers the fundamental knowledge of riveting, riveted joints, aircraft handling and operation, pipe bending, flaring, inspection and testing, bearing and shafts, safety precautions of aircraft operations, introduction to non-destructive inspection, corrosion, aircraft storage methods. The course also covers composite repairs and tools and aircraft ground support equipment (GSE). Pre-requisite: AMEM 1202; Co-requisite: AMEM 2207.

#### **11. AMEM 2204 Aircraft Systems and Components II- Cat A (3 Cr.)**

The course covers fundamentals of aircraft instrument systems: pitot static and gyroscopic; avionics systems: auto-flight, communication and navigation systems; electrical

power: DC and AC generators and power distribution; Lights and on board systems. Pre-requisite: AMEV1201; Co-requisite: None.

#### **12. AMEM 2107 Gas Turbine Engines- Cat A MOD 15A-OCT4 (1 Cr.)**

The OCT course covers: gas turbine engines fundamentals, construction and working principles; gas turbine engine components: inlet section, compressors section, combustion chamber, turbine section, and exhaust section; gas turbine engine systems: starting, fuel, oil, cooling and indication systems. The course also covers safety procedures, monitoring systems, engine ground operation, and thrust augmentation systems. Pre-requisite: AMEM2102; Co-requisite: AMEM2105.

#### **13. AMEM 2205 Propeller- Cat A (2 Cr.)**

The objective of this course is to develop students working skills on aircraft propeller. This course covers the function, fundamental principles of propeller, propeller construction, systems and operation. The course also covers blade element theory, propeller pitch control, propeller synchronizing, ice protection system, propeller maintenance, storage and preservation. Pre-requisite: AMEM2102; Co-requisite: None.

#### **14. AMEM 2090 On-the-Job Training / Internship - (3 Cr.)**

On the Job Training is provided to students under the supervision of a faculty member and/or qualified engineers at a Part 145 licensed establishment. This training aims to expose students to practical applications in Aviation Industry. Pre-requisite: Second year student status; Co-requisite: None.

#### **15. AMEV 1201 Electrical Fundamentals –CAT A - (3 Cr.)**

This course covers the basic principles of electricity such as electron theory, static electricity and conduction, electrical terminology, generation of electricity, DC sources of electricity, and DC theory. This course introduces the concept of direct current circuits and studies its applications and its fundamental theories. Pre-requisite: PHYS 1015; Co-requisite: None.

#### **16. AMEV 3101 Electrical Engineering I (3 Cr.)**

This course provides understanding and skills of aircraft electrical engineering as part of EASA module 3. This course covers the basic principles of electricity such as electron theory, static electricity and conduction, electrical terminology, generation of electricity, DC sources of electricity, and DC theory. This course introduces the concept of direct current circuits and studies its applications and its fundamental theories. Pre-requisite: AMEV1201 ; Co-requisite: AMEV3102.

#### **17. AMEV 3102 Electrical Engineering I Lab (1 Cr.)**

This is a practical course that is conducted in a laboratory/workshop setting. This course covers the practical applications of electrical measurements, generation of electricity, DC and AC sources and their applications. This course's experiments address

the concepts of direct current circuits and verifies the theories behind their operation. Pre-requisite: AMEV1201; Co-requisite: AMEV310.

#### **18. AMEV 1301 Electronics (3 Credits)**

This course covers electronic fundamentals with emphasis on semiconductors such as the diode and the transistor. A fundamental characteristics, properties and uses of these devices are discussed. A brief introduction to integrated circuits, printed circuit board technology, and servo mechanisms are also covered. Pre-requisite: AMEV1201; Co-requisite: None.

#### **19. AMEV 2101 Basic Digital Techniques (2 Cr.)**

The course covers aircraft electronic instrument systems, basic computer structure and electrostatic sensitive devices, typical systems arrangements and cockpit layout of electronic instrument systems, computer terminology, and special handling of components sensitive to electrostatic discharges. Pre-requisite: AMEV1201; Co-requisite: None.

#### **20. AMEV 3103 Electronics Communications Techniques (2 Cr.)**

This course covers the basic principles of radio and electronic communication techniques. AM, FM and other modulation techniques are discussed along with the principles of the super-heterodyne receiver. Phase modulation is introduced and its principles are discussed. Pre-requisite: AMEV 1301; Co-requisite: None.

#### **21. AMEV 3302 Digital Techniques (3 Cr.)**

This course is a continuation of Digital Techniques I covering an advanced level with emphasis put on logic circuits, computer technology as applied in aircrafts. To introduce digital systems and the digital computer as an integral system in the construction of aircraft control systems. Pre-requisite: AMEV AMEV 2101; Co-requisite: None.

#### **22. AMEV 3202 Avionics Systems I (3 Credits)**

This course covers flight theory, general concepts of aero-structures, auto-flight principles, comm. & navigation Systems, and Electrical power generation and regulations. Pre-requisite: AMEM 3103; Co-requisite: None.

#### **23. AMEV 3203 Propulsion and FADEC (3 Credits)**

The course introduces to the constructional arrangement and operation of turbojet, turbofan, turbo shaft, and turbo prop engines, electronic engine control and fuel metering system (FADEC), and covers engine indication systems, their components and their principles of operation. Pre-requisite: AMEM 2105, AMEV 3101; Co-requisite: None.

#### **24. AMEV 3301 Avionics Systems II (3 Credits)**

This course covers aircraft electrical power systems, AC, DC and emergency power systems sources, Electronic emergency equipment, aircraft Equipment and furnishings,

flight controls systems: mechanical, powered systems, instrument, lighting, and on-board maintenance systems. Pre-requisite: AMEV 3103; Co-requisite: None.

## Aircraft Maintenance Courses (CAT B Conversion Courses)

### **25. AMEM 3102 Advanced Materials and Hardware -B1 – (4 Cr.)**

The course covers all types of fasteners and locking devices; this includes: Screws, Bolts and studs, aircraft rivets; the course also covers pipes and unions, springs, bearings and transmissions; gears and belts. In addition the course contains control cables, turnbuckles, compensation devices, pulleys, Bowden cables, and aircraft flexible control systems. Electrical cables and connectors: construction, crimping, connector types and insulators are also covered. Pre-requisite: Physics, AMEM 1201; Co-requisite: None.

### **26. AMEM 3101 Advanced Aerodynamics-B1 (3 Cr.)**

This course provides students with the fundamental principles of aerodynamics. The course will focus on the physics of atmosphere; and basic aerodynamics including: the airflow around a body, airfoil sections, the aerodynamic forces acting on the aircraft, generation of aerodynamic lift and different types of aerodynamic drag. The course also includes theory of flight: the aerodynamic forces and aircraft performance during steady level flight, climb and descent, and turning; and aircraft stability and flight dynamics. Pre-requisite: AMEM 2102; Co-requisite: None.

### **27. AMEM 3103 Advanced Maintenance Practices I-B1 (3 Cr.)**

This course covers safety precautions for aircraft and workshop, workshop practices, calibration of tools and calibration standards, operation, function and use of common avionic general testing equipment. This course emphasizes engineering drawings, diagrams and standards, ATA 100 specifications, common systems of fits and clearances, standard methods for checking shafts, bearings, as well as electrical cables and connectors, wiring protection techniques, bonding practices and testing, riveting, pipes and hoses, springs, bearings, transmissions and control cables. Pre-requisite: AMEM 1202; Co-requisite: None.

### **28. AMEM 3104 Advanced Aircraft Systems and Components I – B1 (3 Cr.)**

This course is intended to provide students with the fundamental principles of the Theory of Flight including aerodynamics, flight controls operations and systems and high speed flight. The course also covers the Airworthiness Requirements of Structural Strength: stresses, zoning, construction methods; primary and secondary structure, the aircraft component and their construction, types of rivets, methods of surface protection, exterior finishing, alignment and symmetry. Pre-requisite: AMEM2104; Co-requisite: None.



### **29. AMEM 3203 Advanced Aircraft Systems and Components II – B1 (3 Cr.)**

Areas of study of this course includes fire protection system: fire and smoke detection, fire warning; hydraulic power: hydraulic systems components, reservoirs, pumps, accumulators, valves, fluid; fuel systems: lay out of the system, components, fuelling and defueling. The course also includes Flight Control Systems: Primary and secondary controls, Manually and power operated control systems; landing gear: purposes, types, extension and retraction, shock strut, wheels tires, brakes systems and nose steering; Pneumatic systems. Operation of On Board Maintenance systems, operation and function of electrical power generation. Pre-requisite: AMEM 2104; Co-requisite: None.

### **30. AMEM 3204 Advanced Gas Turbine Engines – B1 (3 Cr.)**

This course covers an advanced level of gas turbine engine construction and engine systems layout. This includes covering the principles of operation, engine construction, systems and accessory parts. These include engine fuel metering and distribution, FADEC, HMU, and EEC effects on performance and fuel consumption, lubrication systems, oil cooling systems, typical engine installation and mounting, standard safety procedures, monitoring programs, engine ground operation dangers, thrust augmentation systems, CSD, and gearbox systems, fire detection systems, engine installation and ground operation including safety precautions.. Pre-requisite: AMEM 2105, AMEM 3101; Co-requisite: None.

### **31. AMEM 3301 Advanced Propeller – B1 (2 Cr.)**

The objective of this course is to develop students working skills on aircraft propeller. This course covers the function, fundamental principles of propeller, propeller construction, systems and operation. The course also covers blade element theory, propeller pitch control, propeller synchronizing, ice protection system, propeller maintenance, storage and preservation. Pre-requisite: PHYS 1015, AMEM 2205; Co-requisite: None.

### **32. AMEM 3202 Advanced Maintenance Practices II-B1 (3 Cr.)**

This course covers aircraft an advanced level of aircraft parts joining and repair methods comprising; different types of basic welding, brazing and soldering, selecting of appropriate material, filler material and flux. This course also covers aircraft handling and storage, jacking, inspections, effects of environmental conditions on aircraft handling, aircraft repair and assembly techniques, trouble shooting, maintenance procedures and inspections carried out after abnormal events such as lightning strikes, heavy landings and flight through turbulences, maintenance planning, modifications, quality assurance and control. Pre-requisite: AMEM 3103; Co-requisite: None.

### **33. AMEM 1206 - Materials and Hardware OCT- Cat A- MOD 6A (1 Cr.)**

This OCT practical course covers the characteristics of ferrous, non-ferrous, metallic, non-metallic and composite materials, properties and application of sealant and bonding agents, wooden structure and fabric covering. The course also covers various types of corrosion: methods of detection and treatment; aircraft fasteners, their specifications and how they are

applied in aircraft technology; pipes and unions, springs, bearings, transmission and aircraft control cables and end fittings; cable systems components, Bowden cables and aircraft flexible control systems; construction and characteristics of aircraft electrical cables and connectors. Pre-requisite: PHYS1015; Co-requisite: AMEM1201.

#### **34. AMEM 1207 - Aircraft Maintenance Practices I OCT - Mod 7A1-OCT2 (1 Cr.)**

This OCT course covers safety precautions for aircraft and workshops, workshop practices, care and control of tools. The course also includes dimensions, allowances and tolerances, standards of workmanship, calibration of tools and equipment. Pre-requisite: None; Co-requisite: AMEM1201

#### **35. AMEM 2106- Aircraft Systems and Components I OCT - MOD 11A1- OCT3 (1 Cr.)**

This OCT course covers fundamentals of aero-plane theory of flight and flight controls, high speed flight, the airworthiness requirements of structural strength, the aircraft component and their construction, aircraft pressurization and air-conditioning systems, aircraft equipment and furnishings. The course also includes: hydraulic power, pneumatic systems, fire protection system, landing gear, ice protection system, fuel system and water and waste system. Pre-requisite: AMEM 1202; Co-requisite: AMEM2104.

#### **36. AMEM 2206 - Aircraft Maintenance Practices III OCT – CAT A-Mod 7A3-OCT5 (1 Cr.)**

This oct course covers fundamental knowledge of electrical cables, connectors, and wiring protection methods, crimping tools connector pin, coaxial cables, wiring protection technique. The course also covers safetying of aircraft fasteners and electrical systems hardware. Pre-requisite: AMEM 1202; Co-requisite: AMEM2202.

#### **37. AMEM 2207 - Aircraft Maintenance Practices IV OCT- Mod 7A4-OCT6 (1 Cr.)**

This OCT course covers fundamental knowledge of Riveting: rivets and riveted joints, Inspection of riveted joints; Aircraft handling and operation, Pipes: Bending, Flaring, Inspection and testing ; Bearing and shafts, Safety precautions of aircraft operations, NDT Inspection, Corrosion, Aircraft storage methods, Composite repairs and tools, Aircraft Ground Support Equipment (GSE). Pre-requisite: AMEM 1202; Co-requisite: AMEM2203.

### **Aircraft Maintenance Engineering Courses**

#### **38. AMEM 4901 Graduation Project I (3 Cr.)**

This course is a capstone course to develop the student's ability to analyze and synthesize simple but important engineering problems and provide a methodology for understanding the problem and provide a solution. This course is conducted under the supervision of a qualified instructor. Pre-requisite: None. Co-requisite: None.

## Compulsory Courses

### **39. AMEM 4101 Aircraft Maintenance Strategies 3 Cr**

This course covers the objectives of maintenance, its levels and types. also, principles of reliability as applied in maintenance are discussed. All types of maintenance strategies: MSG I, MSG II and MSG III and the concepts of Reliability Centered Maintenance (RCM) are discussed. Pre-requisite: None; Co-requisite: None.

### **40. AMEM 4102 Aircraft Structural Analysis 3 Cr**

This course will cover the elementary physics of materials related to the loads acting on a material and as a consequence their response, degradation of structural and mechanical behaviour due to environment effects, aircraft structural elements and their functions, the loads acting on these structures and elements, then how loads acting on an aircraft or spacecraft structure will induce deformation and stresses within the structure. At the end general characteristics of aircraft structures joining techniques are covered. Pre-requisite: None; Co-requisite: None.

### **41. AMEM 4103 Analysis of Aircraft Value and Maintenance Costs 3 Cr**

The course provides students with the necessary knowledge and skills to fulfill the requirements in the market with relevance to the appraisal practices and maintenance engineering cost in the aircraft. The course will provide insight in long-term value retention of the aircraft and minimising the cost associated with the maintenance. Pre-requisite: None; Co-requisite: None.

### **42. AMEM 4104 – Inspection Procedures 3 Cr**

This course covers aircraft structure inspection, definition and classification of discontinuities: inherent, processing and services discontinuities, NDT general knowledge; basics, techniques, applications, and limitations of visual testing, dye penetrant method, Magnetic Particle Testing, ultrasonic testing, radiographic testing and eddy current test. The course will encourage group discussions around practical problems and provide field expertise on how to resolve them. At the end of this course, the student will understand how to perform inspection of samples, identify defects and the corrective action. Pre-requisite: None; Co-requisite: None.

### **43. AMEM 4201 - Aircraft Structural Repair 3 Cr**

The course provides students with the necessary knowledge and skills to fulfill the requirements in the aerospace industry with relevance to the structural repair in the aircraft. The course will provide an insight in the understanding of the structural integrity, fundamentals of welding, sheet metal construction and repair, basics of composites and aircraft assembly and rigging. Pre-requisite: None; Co-requisite: None.

#### **44. AMEV4102 Automatic Flight Control Systems Maintenance 3 Cr.**

This course covers fundamentals of automatic flight control including working principles and current terminology; Command signal processing; Modes of operation: roll, pitch and yaw channels; Yaw dampers; Stability augmentation system in helicopters; Automatic trim control; Autopilot navigation aids interface; Auto-throttle systems; Automatic landing systems: principles and categories, modes of operation, approach, glide slope, land, go-around, system monitors and failure conditions. Pre-requisite: AMEM 2104, AMEM 3203; Co-requisite: None.

#### **45. AMEM 4202 Aircraft Accident Investigation and Prevention 3 Cr.**

This course is designed to train investigators in ICAO and Aviation regulations, investigation techniques, accident reporting forms, and effective management of resources (time, personnel, and funds) involved in an aircraft accident. This course will cover all aspects of the investigation process to provide participants with both in-depth training and understanding of the fundamental techniques and procedures of field investigations of accidents and incidents. The course presents the investigation management and the technical portion of both investigator's fixed-wing and rotary-wing accident investigation training. Pre-requisite: None; Co-requisite: None.

#### **46. AMEV 4201 Avionics and Instrumentation Systems Maintenance 3 Cr.**

This course covers avionics and instrumentation, which includes radio, navigation, weather radar, autopilot, instrument landing systems (ILS), and other things that help an airplane fly and land. These features make airplanes safer, more stable, and easier for the flight crew to operate. This unit will explain how modern aircraft's avionic systems work. They'll look at many of these systems and their technologies. These systems will be talked about in terms of how hard the flight crew has to work and how well the fuel is used. The unit's main focus is on aircraft navigation, radio communication, radar, and various aircraft instruments. After this lesson, students will be able to understand avionic system schematic diagrams, identify components and subsystems, and understand how they work.. Pre-requisite: None; Co-requisite: None.

#### **47. AMEV 4202 Aircraft Communication and Navigation systems 3 Cr.**

This course covers the operation of radio transmitters, receivers, and aircraft radio navigation systems. They will study aircraft inertial navigation systems and their operation, as well as perform calculations to solve navigation problems. The unit also allows learners to investigate the types, operation, and operating parameters of continuous wave aircraft radar systems. Pre-requisite: None; Co-requisite: None.

#### **48. AMEM 4902 Graduation Project II (3 credits)**

The purpose of this course is to instil in the students some basic engineering/technology research skills / management knowledge, and to guide them to complete a cycle managing an aviation related engineering project from start to finish. The instructor of the course will give a series of lectures pertaining to engineering technology and provide the student with the opportunity to exercise his learning in

implementing a project based on the principles discussed in class. Pre-requisite: AMEM 4901; Co-requisite: None.

## Elective Courses

### **49. AMEM 4301 Analysis of Aircraft Maintenance and procedures 3 Cr**

The overall objectives of this unit are to develop students' ability to evaluate aircraft maintenance practice applications and procedures. This unit covers the life and reliability in aircraft engineering operation, aviation condition maintenance, aircraft reliability estimation requirements and aircraft operators and manufacture roles and responsibilities. Pre-requisite: None; Co-requisite: None.

### **50. AMEM4302 Aircraft Materials and processes 3 Cr**

This course is intended to equip the students with requisite familiarity with the materials for aircraft construction. The focus is thus on structural materials for airframe, covering their mechanical behavior, major processes such heat-treatments of alloys and curing of composites, scientific principles behind alloying and their heat/mechanical treatments, relevance for aircraft structures and usage in aircraft. Major materials included are Al-alloys, Ti-Alloys, Aircraft steels and fiber composites. Study of other materials, such as transparent materials used in aircraft, coatings and adhesives, and also materials used in aero-engines is limited to only a brief overview. Pre-requisite: None; Co-requisite: None.

### **51. AMEM 4303 Aircraft Mass and Balance 3 Cr**

This course is designed to provide students with the necessary background knowledge and skills required to perform their duties and assuming their responsibilities. The emphasis is on developing an understanding and providing a rigorous introduction to the basic principles and procedures of the aircraft weight and balance, principles, procedure and reporting. Pre-requisite: None; Co-requisite: None.

### **52. AMEV 4301 Artificial Intelligence in Aircraft Maintenance 3 Cr.**

This course focuses on three areas of AI-based technology: Neural Networks, fuzzy logic, and Expert Systems. This course gives the learner a background in these fields and a basic understanding of how they work. This includes languages, tools, and AI-based hardware. Pre-requisite: None; Co-requisite: None.

### **53. AMEM 4104 Aircraft Maintenance and Flight Line Safety 3 Cr**

This course covers topics on the basic principles of Maintenance safety concepts, maintenance hazards, personnel responsibilities, fire precautions, maintenance shops safety, tools control and safety, electric and electronic safety, mercury hazards, radiation safety, high pressure safety, flight line safety: jet aircraft, towing vehicles, Composite Materials Precautions, FOD: categories, effect, cost, prevention policy and procedures. Pre-requisite: None; Co-requisite: None.

#### **54. AMT 408 – Aviation Inventory and Logistics 3 Cr**

This course includes an Introduction to Composite Materials: Definitions, History of composites, Basic Terminology, Constituent materials, Mechanical Behavior of composites, and current and potential Advantages of fiber-reinforced composite materials. The course also covers the Classification of Composite Materials and the Basic Characteristics and Applications of each form of composites in Aviation Industry, especially Composite Laminates and Sandwich Structures. Manufacturing of composites, failure theories and fracture mechanics, and comprehensive concepts of the Inspection, and Repair of composite structures will also be addressed. Pre-requisite: None; Co-requisite: None.

#### **55. AMEV4302 - Aircraft Electrical Systems 3 Cr**

This course provides a comprehensive overview of aircraft electrical systems and fundamentals, covering topics such as power generation, distribution, batteries, starting systems, and load management. Additionally, the course delves into electrical control, monitoring systems, avionics systems, and interfaces. Lightning protection, bonding, electrical safety, and human factors are also discussed in detail. Upon completing this course, learners will have a strong understanding of the workings of aircraft electrical systems, including safety precautions and best practices. Pre-requisite: None; Co-requisite: None.