

# Noorul Islam Centre for Higher Education

(Deemed to be University u/s 3 of the UGC Act 1956)

Kumaracoil, Thuckalay, Kanyakumari District - 629 180

Accredited by NAAC with 'A' Grade

AC22 Aircraft Maintenance Engineering



## Student Performance and Learning Outcomes

## AC22 Aircraft Maintenance Engineering

<b>Programme Outcome– PO</b>	
PO-A	Graduates will be familiarized with the basic and principal elements of the course
PO-B	Ability to apply the separate elements of knowledge in a logical and comprehensive manner to reach valid conclusions.
PO-C	Capable of applying his/her knowledge in a practical manner using manufacturer's instructions.
PO-D	The problem solving skills with due consideration to human factors will be developed.
PO-E	Graduates will develop to apply his knowledge in a practical manner using detailed procedures.
PO-F	The skills to work in a multidisciplinary team will be incorporated.
PO-G	The verbal and written communicative skills of the graduates to will be enriched.
PO-H	The roles and responsibilities of an aircraft maintenance engineer in the society will be unfolded.
PO-I	Analyzing the social and environmental aspects of engineering activities will be improved.
PO-J	Graduates will be able to apply professional ethics, accountability and equity in the work place and in society.
PO-K	Ability to use economics and maintenance practices in the industry is explained.
PO-L	Graduates will be enabled to understand and apply the modern maintenance issues and practices continually.
PO-M	Graduates will be empowered to develop supplementary and valuable practices for maintenance issues.

<b>Programme Specific Outcome</b>	
PSO1	A general awareness about the aviation industry including its manufacturing and maintenance.
PSO2	Understand and practical knowledge about Aircraft Maintenance on Airframe, Power plant, and Systems.
PSO3	Perform maintenance work in any aircrafts.

<b>Sl.No</b>	<b>Subject Code</b>	<b>Subject Name</b>
<b>SEMESTER II</b>		
1.	EG2102	Technical English – II
2.	MA2102	Engineering Mathematics – II
3.	BS2103	Environmental Science
4.	ME2201	Engineering Graphics
5.	ME2205	Engineering Mechanics
6.	AC2201	Aircraft General Engineering and Maintenance Practices
7.	AC2271	Aircraft Component Drawing
8.	AC2272	Airframe Repair and Maintenance Laboratory
<b>SEMESTER IV</b>		
9.	MA2203	Numerical Methods
10.	AC2209	Electrical Fundamentals-I
11.	AC2210	Materials and Hardware-I
12.	AC2211	Aviation Legislation - III
13.	AC2212	Turbine Aeroplane Aerodynamics, Structures and Systems-I
14.	AC2213	Maintenance Practices-II
15.	AC2276	Turbine Aeroplane Aerodynamics, Structures and Systems Lab -I
16.	AC2277	Electrical Fundamentals Lab -I
<b>SEMESTER VI</b>		
17.	IT1212	Cyber Security
18.	AC1222	Electronic Fundamentals
19.	AC1215	Dynamics of Aircraft Flights
20.	AC1223	Maintenance Practices - III
21.	AC1224	Gas Turbine Engine-II
22.	AC1286	Electronic Fundamentals Lab
23.	AC1287	Maintenance Practices Lab - II
24.	AC1288	Gas Turbine Engine Lab -II
<b>SEMESTER VIII</b>		
25.	AC12P4	On Job Training (AMO)(OJT)
26.	AC12P5	MAIN PROJECT

### Course Outcomes

#### EG2102 - Technical English – II

CO1	The Students will be able to improve their vocabulary and use articles and prepositions effectively in sentences.
CO2	The students will be able to understand grammatical items like phrases and verbs, derivatives, relative pronouns etc. and thereby enhance their linguistic competence.
CO3	The students will be able to acquire the essentials of writing skills relating to resume writing, E-mail writing and also the essential components of essay writing.
CO4	The students will be able to learn the basics of letter writing and the formalities involved in writing formal and business letters.
CO5	The students will be able to learn English Phonemes such as vowels, Diphthongs, consonants, Stress and Intonation.

#### MA2102-Engineering Mathematics – II

CO1	Understand the linear differential equations with constant and variable coefficients. To solve the Cauchy's and Legendre's linear equations and solve the differential equations by variation of parameters.
CO2	Know about a functions of a complex variable, analytic functions, Cauchy's Riemann equations. To prove the properties of analytic functions. To find analytic functions and bilinear transformations.
CO3	Study about Cauchy's integral formula and Cauchy's integral theorem and Laurent expressions. Know about singular point and Cauchy's Residue theorem. To evaluate the integrals by Contour integration.
CO4	Know about Gradient, Divergence, Curl, Directional derivative, Irrotational and solenoidal vector field. To verify the vector integration by Green's theorem, Gauss divergence theorem and Stoke's theorem.
CO5	Obtain the Laplace transform of elementary functions, Transform of derivatives and integrals and periodic functions. To find the inverse Laplace transform using convolution theorem and solve the differential equations.

#### BS2103-Environmental Science

CO1	Ability to learn about the nature of environment studies and natural resources.
CO2	Understand the concept of ecosystems and bio-diversity.
CO3	Realize the causes and Understand the concept and effects of environmental pollution.
CO4	Able to understand the interaction between social issues and the environment.
CO5	Reflects the effects of human population and environment.

#### ME2201 - Engineering Graphics

CO1	Familiarize with the fundamental standards applied in engineering graphics and perform free hand sketching of basic geometrical construction and multiple views of object.
CO2	Project orthographic projection of points, line and plane surfaces.
CO3	Understand and draw the projection of solids and its sections.
CO4	Visualize and project isometric views.

CO5	Understand and draw development t of different solids and project orthographic projection of various machine parts.
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ME2205 - Engineering Mechanics	
CO1	To apply mathematics and science to simple and practical problems in engineering
CO2	Ability to solve complex problems in reactions and internal forces in beams
CO3	Determination of centroid and moment of inertia of a different geometrical shape and understand its importance
CO4	Know the basics of friction and its importance through simple applications
CO5	Ability to analyze the problems on motion of particles and rigid bodies

AC2201-Aircraft General Engineering and Maintenance Practices	
CO1	Able to acquire knowledge of maintenance and handling of equipments used in the maintenance of aircraft.
CO2	Able to acquire knowledge of materials,parts and use of hand tools
CO3	Able to know the knowledge of commonly used ferrous,nonferrous and composite materials
CO4	Able to know the knowledge of various types of diodes/triodes/transistors and their functions
CO5	Able to know the functions of the major aircraft components and types of propulsion systems used in aircraft industry.

AC2271-Aircraft Component Drawing	
CO1	Understand the control components used in aircraft
CO2	Study the design of rivet and welded joints
CO3	Able to draw the CAM profile
CO4	Understand the layout of wing, fuselage structure and control systems
CO5	Able to draw the front , side and top view of aircraft Boeing 737

AC2272 - Airframe Repair and Maintenance Laboratory	
CO1	Able to acquire knowledge on fabric patch repair
CO2	Able to identify, single welding joint
CO3	Understand the basics of MIG welding
CO4	Remember the Knowledge about TIG Welding
CO5	Understanding the bending and Flaring

MA2203 - Numerical Methods	
CO1	Compute the solution of nonlinear equations using N.R method Fixed point iteration method. Solve a linear system of equation using direct iteration method.
CO2	Apply Interpolation for equal and unequal intervals using Newton's forward, backward divided difference and Lagrange's method.
CO3	Compute the derivatives of functions using numerical values for equal and unequal intervals. Evaluate numerical integration by using Trapezoidal Simpson's Gaussian Quadrature.
CO4	Solve the initial value problem of first order Ordinary Differential Equation by using single and multistep methods.

CO5	Find the finite difference solution of boundary value problem.
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AC2209- Electrical Fundamentals I	
CO1	Able to understand the basics of electron theory , electrical terminologies and power calculations
CO2	Get the knowledge of static electricity, generation of electricity , lead acid battery and Nickel Cadmium Battery
CO3	Acquire knowledge on KVL, KCL and ohms law and their applications. Basics of thermocouple and photocell
CO4	Get the knowledge on the basic concept, construction, color coding, series, parallel connections and power dissipation in resistors.
CO5	Acquire knowledge on the basic operations, types, factors affecting, parallel and series connections, capacitors in Ac circuit and testing of capacitors.

AC2210 – Materials and Hardware -I	
CO1	Basic understanding of the ferrous and non- ferrous aircraft materials
CO2	Knowledge in the composite aircraft materials
CO3	Knowledge on the wooden structures
CO4	Understanding in the fabric covering
CO5	Knowledge on the corrosion and bearings

AC2211 - Aviation Legislation - III	
CO1	Basic understanding of the ferrous avionics general test equipment
CO2	Knowledge in the riveting and pipes and hoses
CO3	Knowledge on the springs and bearings
CO4	Understanding in the disassembly inspection repair and assembly techniques
CO5	Knowledge on the maintenances procedures

AC2212 - Turbine Aeroplane Aerodynamics, Structures and Systems-I	
CO1	Basic understanding of the theory of flight
CO2	Knowledge in the high speed flight
CO3	Knowledge on the airframe structures general concepts
CO4	Understanding in the air condition and cabin pressurization
CO5	Knowledge on the avionics instruments systems

AC2213 - Maintenance Practices-II	
CO1	Understanding fits and clearances
CO2	Remember Knowledge about the welding
CO3	Apply the techniques about the brazing soldering and bonding
CO4	Remember the Knowledge about the aircraft weight and balance
CO5	Understanding the techniques to material handling

AC2276 - Turbine Aeroplane Aerodynamics, Structures and Systems Lab -I	
CO1	Understanding the basics of Theory of Flight: Aeroplane Aerodynamics and Flight Controls
CO2	Able to acquire knowledge on the Removal and installation of flaps and spoilers
CO3	Able to prepare formers, stringers, longerons, bulkheads, frames, doublers
CO4	Able to identify, landing gear attachment and components
CO5	Able to Air conditioning system

AC2277 – Electrical Fundamentals Lab I	
CO1	Understand the basics of electricity- generation, cells and measuring instruments
CO2	Able to acquire knowledge on the types of connection, charging and discharging of cells.
CO3	Able to prepare electrolyte for cells. Enabled to perform soldering and de-soldering
CO4	Able to identify, connect and test capacitors and resistors
CO5	Able to remove and install battery in Learjet

IT1212 Cyber Security	
CO1	Remember and understand the principles of computer organization and communicate effectively to discuss about the OS and architectures.
CO2	Understand and identify the information security fundamentals and apply them in E-commerce.
CO3	Remember and understand the security threats and test the programming bugs in computing systems.
CO4	Understand the security principles and apply the skills and tools for the computing system.
CO5	Apply the cyber laws, ethics and cyber forensic tools in computing systems and social networks.

AC1222 –Electronic Fundamentals	
CO1	Able to understand the Fundamentals of basics electronics
CO2	Understand about the transistors and characteristics
CO3	Ability to know about the amplifiers and its applications
CO4	Get the knowledge on the basic concept of Integrated circuits and its applications
CO5	Understand and the operation & components of various synchronous system of PCB

AC1215 Dynamics of Aircraft Flights	
CO1	Basic understanding of the ability to analyses the performance of aircraft under various flight conditions
CO2	Knowledge in the aircraft maneuvering flight performance
CO3	Knowledge on the static longitudinal stability
CO4	Understanding in the lateral and directional stability
CO5	Knowledge on the dynamic stability

AC1223 Maintenance Practices – III

CO1	Understand the knowledge Electrical Wiring Interconnection System (EWIS)
CO2	Understand the concept of Pipes and Hoses
CO3	Able to acquire knowledge of Demonstration of bearing defects
CO4	Able to acquire knowledge of the Composite and non-metallic
CO5	Able to know the fundamentals of Inspection, Repair and Assembly Techniques

AC1224-GasTurbine Engine II

CO1	Understand the knowledge of engine starting systems.
CO2	Understand the concept of engine indicating and power augmentation systems
CO3	Able to acquire knowledge of the engine controls and auxiliary power units
CO4	Able to acquire knowledge of the power plant installation and fire protection systems
CO5	Able to know the fundamentals of ground handling techniques

AC1286 –Electronic Fundamentals Lab

CO1	Able to acquire knowledge on the types of Diodes
CO2	Able to identify, connect wiring and PCB
CO3	Understand the basics of transistors
CO4	Remember the Knowledge about voltage regulator (Zenar diode)
CO5	Understanding the ARINC system

AC1287 - Maintenance Practices Lab - II

CO1	Understand the knowledge Electrical Wiring Interconnection System (EWIS)
CO2	Understand the concept of Pipes and Hoses
CO3	Able to acquire knowledge of Demonstration of bearing defects
CO4	Able to acquire knowledge of the Composite and non-metallic
CO5	Able to know the fundamentals of Inspection, Repair and Assembly Techniques

AC1288 - Gas Turbine Engine Lab -II

CO1	Understanding air system
CO2	Remember Knowledge about starting and ignition system
CO3	Apply the techniques about the engine indication system
CO4	Remember the Knowledge about the fire protection system
CO5	Understanding the engine monitoring and ground operation system



AC12P4 - On Job Training (AMO)(OJT)	
CO1	Understanding aircraft ground operation
CO2	Remember Knowledge about aircraft maintenance
CO3	Apply the techniques about the aircraft cockpit instruments
CO4	Remember the Knowledge about the aircraft undercarriage systems
CO5	Understanding the techniques to aircraft weight and balance.

AC12P5 MAIN PROJECT	
CO1	Demonstrate a sound technical knowledge of their selected project topic.
CO2	Undertake problem identification, formulation and solution.
CO3	Design engineering solutions to complex problems utilising a systems approach.
CO4	Conduct an engineering project
CO5	Demonstrate the knowledge, skills and attitudes of a professional engineer.