

University of Management and Technology

Course Outline

Course code: ET 233

Course title: Materials and Hardware II

Program	BSc Aircraft Maintenance Engineering Technology	
Credit Hours	02+01	
Duration	15 weeks	
Prerequisites	ET 232	
Resource Person	Fatima Najeeb Khan	
Counseling Timing (Room#)	Tuesday	14:00 to 17:00
	Thursday	14:00 to 17:00
	Friday	14:00 to 17:00
Contact	fatima.najeeb@umt.edu.pk	

Chairman/Director signature.....

Dean's signature.....

Date.....

Learning Objective:

This course equips students with the knowledge of the hardware used in the construction, maintenance and repair of aircraft. The course introduces hardware classification. After studying this course, students will have detailed understanding of hardware nomenclature, types, classification, and designation. The applications and characteristics will be discussed in detail. It also covers corrosion recognition, prevention and control while the content on hardware includes fastening and locking devices, piping and transmission hardware and flexible control cables.

Upon successful completion of the course, the student should be able to:

S No	CLO Statement	PLO	Learning Domain and level
1.	Demonstrate understanding of general properties of hardware commonly used in aircraft construction.	1	C2
2.	Define and identify common aircraft fasteners and general hardware used in fluid and power transmission.	1	C2
3.	Conduct and Interpret the results of experiments and demonstrations of Aircraft Material Properties.	3	P3
4.	Effectively communicate experiment results through both written reports and oral Presentations	10	P3

1. CLO – PLO MAPPING:

CLOs	PLOs											
	Engineering Knowledge	Problem Analysis	Design / Development of Solutions	Investigation	Modern Tool Usage	The Engineering Technologist and Society	Environment and Sustainability	Ethics	Individual and Team Work	Communication	Project Management	Lifelong Learning
	1	2	3	4	5	6	7	8	9	10	11	12
1	C2											
2	C2											
3			P3									
4										P3		

Learning Methodology:

- The teaching of the course will be via a series of lectures. This will be complemented by the use of textbook, and an extensive range of web resources plus handouts/articles and video clips.
- Participants should expect 5-6 class activities during the semester which will form the basis for evaluation (viva). 2 assignments, individual/group presentations and quizzes. These activities will be complemented with discussions and analysis to strengthen the learning.

Recommended Text Books:

1 .“Materials and Hardware” by AERO-Bildung Germany [2014]

Reference Books:

1. “Materials and Hardware”-Aviation Maintenance Technician Certification Series by Aircraft Technical Book Company

Grade Evaluation Criteria

Following is the criteria for the distribution of marks to evaluate final grade in a semester.

Marks Evaluation

Marks in percentage

Theory:

Marks Evaluation	Marks in percentage
Quizzes (x6)	15%
Assignments (x2)	10%
Evaluation(Viva)	5%
Presentation	5%
Mid Term Examination	25%
End Term Examination	40%
Total	100 %

Practical:

Marks Evaluation	Marks Percentage
Class activity	5%
Team work	5%
Quizzes	15%
Viva	5%
Lab Report	10%
Final Evaluation	60%
Total	100%

Calendar of Course contents to be covered during semester

Course code: ET 233

Course title: Materials and Hardware II

Week	Course Contents	Reference Chapter(s)	Quiz	Assignments	CLOs
1	Introduction to hardware used in aircraft repair and maintenance Bolts, Studs, and Screws	6.5	1	1	1
2-3	Locking Devices Aircraft rivets	6.5			
4	Pipes and Unions	6.6	2	1	1
5	Springs	6.7			
6	Bearings	6.8		1	1

7	Transmission Gear types and application	6.9			
8	Mid Term Examination				
9-10	Transmission Gear ratios, reduction and multiplication gear systems, driven and driving gears, idler gears, mesh patterns	6.9	3	2	2
11	Control Cables Types and Cable System Components	6.10			
12-13	Control Cables. Bowden Cables, Aircraft Flexible Control Systems	6.10			
14	Electrical Cables and Connectors Construction and Characteristics High Tension and Coaxial Cables	6.11	4	2	2
15	Electrical Cables and Connectors Crimping, Connector types, Pins, Plugs, Sockets, Insulators	6.11			

Materials and Hardware II Lab Outline

Sr. No.	Objective	Experiment Number	CLOs
1	Identification of Standards and Derive the Specification for Bolts	1	3,4
2	Fitting and removal of cotter pin, plain washer and nylon lock nut	2	
3	Demonstrate competence on wire locking a variety of assembly: bolt heads and turnbuckle	3	
4	Identification of the control cables and cable dimensions	4	
5	Preparation of cable ends using cable crimping tools and crimping cables	5	
6	Identification of a range of solid and blind rivets and a range of rivet setting equipment	6	
7	Bearing cleaning, fitting & lubrication	7	
8	To obtain Right hand screw threaded workpiece of given dimensions	8	
9	To create a Hexagonal Head on a circular rod by using Plain indexing method	9	
10	Formation of spur gear by using involute gear cutter on horizontal milling machine	10	

Class Policy

STUDENTS ARE REQUIRED TO READ AND UNDERSTAND ALL ITEMS OUTLINED IN THE PARTICIPANT HANDBOOK

CLASS ATTENDANCE: Students need to be in class at the assigned time. After 10 minutes past the assigned time, the students will be marked absent.

TURN OFF MOBILE PHONE! It is unprofessional to be texting or otherwise.

READ EMAILS! Participants should regularly check their university emails accounts regularly and respond accordingly. Students would be responsible if they miss a deadline because of not reading the emails.

CLASS ATTENDANCE POLICY: A minimum of 80% attendance is required for a participant to be eligible to sit in the final examination. Being sick and going to weddings is absence and will not be counted as present. Participants with less than 80% of attendance in a course will not be allowed to take end term exams. International students who will be leaving for visa during semester should not use any days off except for visa trip to avoid reaching short attendance.

MOODLE: UMT –LMS (Moodle) is an Open Source Course Management System (CMS), also known as a learning Management System (LMS). Participants should regularly visit the course website on MOODLE Course Management system, and fully benefit from its capabilities. In case of any problem while using MOODLE, visit <http://oit.umt.edu.pk/moodle>. For queries email moodle@umt.edu.pk

HARASSMENT POLICY: Sexual or any other harassment is prohibited and is constituted as punishable offence. Sexual or any other harassment of any participant will not be tolerated. All actions categorized as sexual or any other harassment when done physically or verbally would also be considered as sexual harassment when done using electronic media such as computers, mobiles, internet, emails etc.

USE OF UNFAIR MEANS/ HONESTY POLICY: Any participant found using unfair means or assisting another participant during a class test/quiz, assignments or examination would be liable to disciplinary action.

PLAGIARISM POLICY: All students are required to attach a “Turnitin” report on every assignment, big or small. Any student who attempts to bypass “Turnitin” will receive “F” grade which will count towards the CGPA. The participants submit the plagiarism report to the resource person with every assignment, report, project, thesis etc. If student attempts to cheat Turnitin, a second “F” will be awarded that will count towards the CGPA. There are special rules on plagiarism for final reports etc. all outlined in your handbook.

COURSE WITHDRAWAL POLICY: Students may withdraw from a course till the end of the 12th week of the semester. Consequently, grade 'W' will be awarded to the student which shall have no impact on the calculation of the GPA of the student. A Student withdrawing after the 12th week shall be automatically awarded "F" grade which shall count in the GPA.

COMMUNICATION OF RESULTS: The results of quizzes and assignments are communicated to the participants during the semester and answer books are returned. It is the responsibility of the course instructor to keep the participants informed about his/her progress during the semester. The course instructor will inform a participant at least one week before the final examination related to his or her performance in the course.

Faculty Signature

Date.....