**University of Management and Technology**

**Course Outline**

Course code: AT 101 Course title: Introduction to Maintenance Engineering

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| --- | --- |
| Program | BSc Aircraft Maintenance Engineering Technology |
| Credit Hours | 03 |
| Duration | 15 weeks |
| Prerequisites | Nil |
| Resource Person | Beenish Batul |
| Counseling Timing  (Room# ) | |  |  | | --- | --- | | Monday | 10.00 to 13.00 pm | | Wednesday | 11.00 to 16.00 pm | | Friday | 10.00 to 14.00 pm | |
| Contact | Beenish.batul@umt.edu.pk |

**Chairman/Director signature………………………………….**

**Dean’s signature…………………………… Date………………………………………….**

**Learning Objective:**

The course is designed for engineering students to understand the effect of management strategies and techniques on the output of aircraft maintenance programs.

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

|  |  |  |  |
| --- | --- | --- | --- |
| **S No** | **CLO Statement** | **PLO** | **Learning Domain and level** |
| 1. | Understand the fundamentals and philosophies of management in creating reliable maintenance programs | 1 | C1 |
| 2. | Identify the system errors using system diagnostic techniques | 2 | C1 |
| 3. | Develop a strong sense of responsibility towards professional, legal, and ethical standards of working in an organization | 8 | C2 |

**Learning Methodology:**

* The course content is designed as a mixture of theory lectures and handouts.
* Case studies and worked examples involving hands on practice are designed as part of the course to consolidate learning.
* Participants will be evaluated based on assignments and quizzes from theory, worked examples and individual/group presentations.

**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 (100%):**

|  |  |
| --- | --- |
| **Quizzes (x6)** | 15% |
| **Assignments (x4)** | 25% |
| **Mid Term Examination** | 25% |
| **End Term Examination** | 35% |

**Recommended Text Books:**

R. C. Mishra, K. Pathak, *Maintenance Engineering and Management,* Prentice Hall of India, 2012

**Reference Books:**

1. “B. S. Dhillon, *Engineering Maintenance: A Modern Approach*, CRC Press, London, 2002
2. R. K. Mobley, L. R. Higgins, D. J. Wikoff, *Maintenance Engineering Handbook Eighth Edition,* McGraw-Hill, 2014.

**Calendar of Course contents to be covered during semester**

**Course code: AT 101 Course title: Introduction to Maintenance Engineering**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Week** | **Course Contents** | | **Reference Chapter(s)** | | |
| 1 | Introduction to maintenance  Maintenance objectives  Types of maintenance systems  Planning and control of maintenance activities | | Class Lectures from text and ref books | | |
| 2 | Types of maintenance (corrective, preventive, predictive, RCM) | | Class Lectures from text and ref books | | |
| 3 | Essentials of aircraft maintenance management such as management structure, qualified personnel, maintenance documentation, and technical publications | | Class Lectures from text and ref books | | |
| 4-5 | Human error in maintenance, frequency of error, and maintenance error in system life cycle and breakdown of maintenance person’s time | | Class Lectures from text and ref books | | |
| 6 | Error types and outcomes of maintenance incidents  Reasons for maintenance errors  Guidelines for reducing human error in maintenance | | Class Lectures from text and ref books | | |
| 7 | Techniques to predict the occurrence of human error in maintenance  Markov method  Fault tree analysis method | | Class Lectures from text and ref books | | |
| 8 | Mid Term Examination | | Class Lectures from text and ref books | | |
| 9 | Introduction to quality maintenance process, its need, and quality control charts for use in maintenance | | Class Lectures from text and ref books | | |
| 10 | Standards for Maintenance Documentation | | Class Lectures from text and ref books | | |
| 11-12 | | Safety and maintenance tasks, related facts and figures, examples, safety problems and their reasons  Guidelines for equipment designers to improve  safety in maintenance  Maintenance safety related questions for equipment manufacturers  Maintenance personnel safety | | Class Lectures from text and ref books |
| 13-14 | | Battery inspection and maintenance techniques for Nickel Cadmium and Lead Acid batteries  Corrosion: causes, effects, and forms of corrosion  Preventive maintenance for corrosion control  Cleaning practices for various metals and alloys | | Class Lectures from text and ref books |
| 15 | | Motor maintenance; maintenance schedule | | Class Lectures from text and ref books |

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](mailto: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………………………………………….**