



The Faculty of Power
and Aeronautical Engineering



WARSAW UNIVERSITY OF TECHNOLOGY



AIRCRAFT DESIGN DEPARTMENT

ANK 315 AIRCRAFT MAINTENANCE

LECTURE 1

INTRODUCTION

Kamila Kustron, Ph. D.



KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

Projekt „Program rozwoju dydaktycznego Wydziału Mechanicznego Energetyki i Lotnictwa

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY





AGENDA

- ❑ INTRODUCTION
- ❑ OBJECTIVE, CONTENTS
- ❑ ABILITIES
- ❑ ASSESSMENT METHOD
- ❑ PREREQUISITES
- ❑ RECOMMENDED LITERATURE
- ❑ LECTURE'S PROGRAMME

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**SYSTEM
AVIATION**



AVIATION SYSTEM



**CIVIL AVIATION SYSTEM
STRUCTURES OF SYSTEMS
DEPENDABILITY, RELIABILITY, AVAILABILITY, SAFETY,
INTEGRITY, MAINTABILITY
QUALITY
MANAGEMENT
SAFETY MANAGENENT, ANNEX 19, ICAO, SARPs,
SAFETY MANAGENENT SYSTEM**

**PREVENTION DAMAGES
DAMAGES: THE REASON FOR MAINTENANCE
FAULTS
DEFECTS
DIFFERENT MATERIALS
MANUFACTURING DAMAGES
SERVICE-INDUCED DAMAGES**

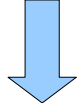




THE MAIN GOAL OF STRUCTURAL DESIGNER IS TO DESIGN COMPONENTS THAT EFFECTIVELY PERFORM A SPECIFIED FUNCTION FOR A GIVEN PERIOD OF SERVICE. ESSENTIAL TO UNDERSTAND AND ANTICIPATE ALL POSSIBLE FAILURE MODES THAT COULD OCCUR IN SERVICE AND PROVIDE STRUCTURE WITH ABILITY TO RESIST THESE FAILURE MECHANISMS



FAILURES MODES



**SYSTEM: STRUCTURE OF AIRCRAFT
SYSTEM: OPERATION
SYSTEM: MAINTENANCE
MAINTENANCE, AIRWORTHINESS
MANAGE AIRWORTHINESS
CONTINUOUS AIRWORTHINESS MANAGEMENT
CAME**

**AVIATION
AUTHORITIES,
AVIATION LAW,
MAINTENANCE**

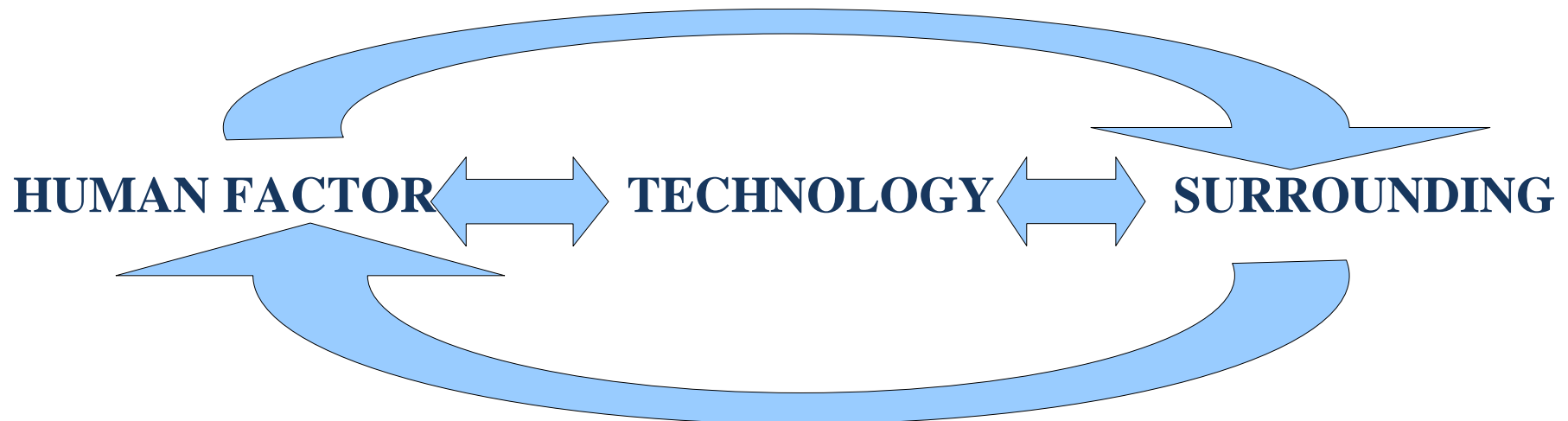
REGULATIONS





**LIFE CYCLE
LIFE CYCLE COSTS
MAINTENANCE**

**HUMAN FACTOR (HF)
TECHNOLOGY
SURROUNDING/ENVIRONMENT
SYSTEM**



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Course Title: Aircraft Maintenance			
Type of course: undergraduate, full time			
Field of study (Programme), specialization: Lotnictwo i Kosmonautyka; Aerospace Engineering			
Faculty course (module) code: ANK315	Semester : 6	ECTS:	2
Level of course (module): basic		Compulsory:	
Format (Teaching methods)	Weekly- 2 Lectures	course graded during semester	
Lecturers (Course leader): dr inż. Kamila Kustron			

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Objective: Knowledge about organizations of the contemporary aviation. Skills of modeling the basic maintenance system from safety and cost-effectiveness point of view. Knowledge degradation processes and aging aircraft

Contents (lecture's programme): Aviation regulations. Dependences between design and maintenance policies from safety and cost-effectiveness point of view. Aircraft and airspace as elements in exploitations systems. Maintenance systems. Modeling of operation&maintenance process and effectiveness of exploitation system. Reliability, availability, durability, sustainability, safety and security problems and their assessment. Maintenance of aging aircraft and novel aircraft. Reliability and maintenance characterization. Diagnostic methods: non destructive testing (NDT) and health monitoring (SHM, EHM, HUMS). Flight safety

Abilities: After completing this course the students will have skills to improve maintenance from safety and cost-effectiveness points of view

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- 1 INTRODUCTION TO AIRCRAFT MAINTENANCE
- 2 **STUDENTS' PRESENTATIONS (INTRODUCING YOURSELF IN A PRESENTATION**
MAINTENANCE POLICIES
- 3 AVIATION ORGANIZATIONS, AUTHORITY REGULATIONS;
- 4 **STUDENTS' PRESENTATIONS**
- 5 DEPENDABILITY, RELIABILITY, AVAILABILITY, SAFETY, INTEGRITY,
MAINTAINABILITY, RELIABILITY OF SYSTEMS, FMEA/FMECA, FTA, **HOMEWORK 1**
- 6 DEGRADATION PROCESSES, DAMAGES, RCM, MSG3 , **HOMEWORK 2**
- 7 INTRODUCTION TO DIAGNOSTICS, NDT, SHM, EHM, HUMS
- 8 MAINTENANCE PROGRAM,
- 9 OPTIMIZATION OF MAINTENANCE PROGRAM, **HOMEWORK 3**
- 10 HUMAN FACTOR AND FLIGHT SAFETY
- 11 PREPARING TO THE FINAL TEST
- 12 **FINAL TEST I**
- 13 **SUMMARY and CONCLUSION of TEST**
- 14 **FINAL TEST II**
- 15 **FINAL SUMMARY AND CONCLUSIONS**

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Assessment method:

Positive mark (min. 60%) of the final test (**7 tasks, scoring: 0-10**);

FINAL TEST: 60% - 3.0; 80% - 4.0; 100% - 5.0

+ 3 homeworks, **scoring: 0-10 / each**

+ 1 st presentation: (2 min.) **(10)**

+ 2nd group presentation: (10-15 min.) Aviation Authority in your country
(10/each person);

+ 3rd: individual presentation (5 min.: one subtopic of the scheduled program which have
to be declared minimum 2 weeks before presenting) **(10-20)**

..... **70**

Prerequisites: No, but

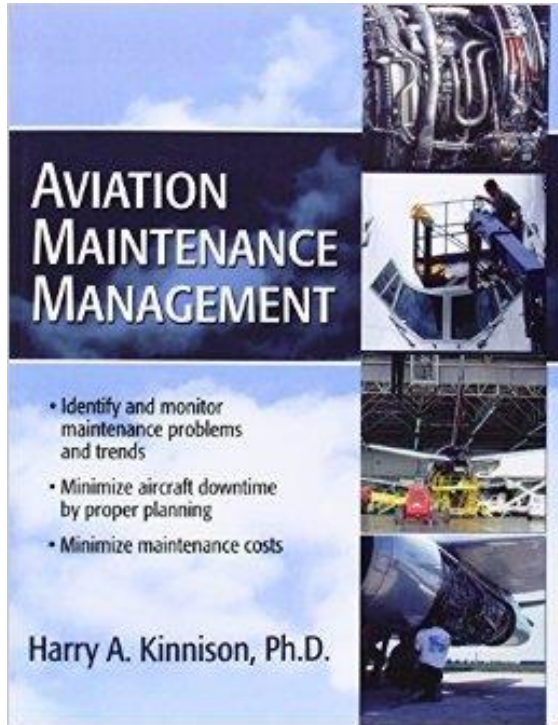


Recommended texts (reading):

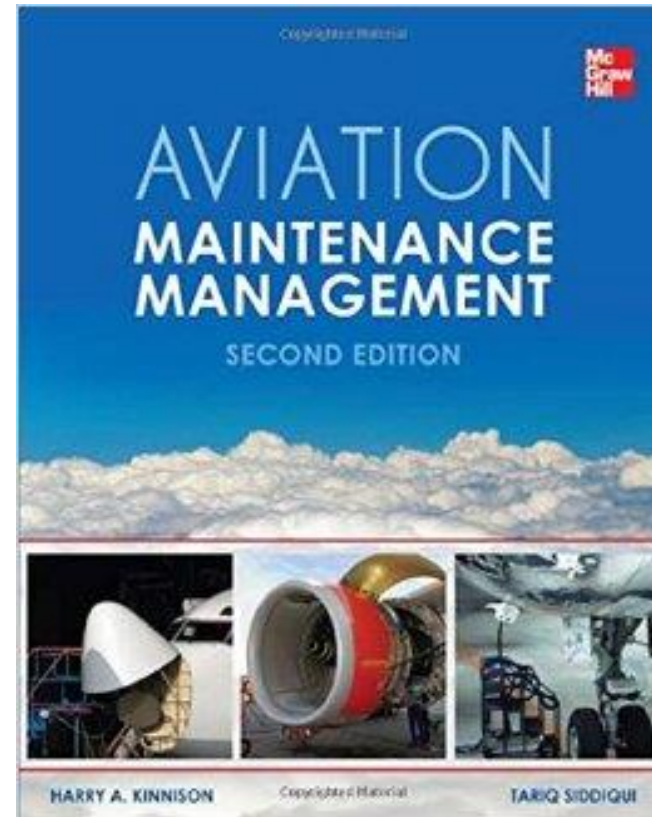
Croes M, Watkns W., Delp F.: Aircraft Maintenance and Repair.

2010 maintenance Library, Publisher: Aircraft Technical Book Company. Edition 2010 (printable CD)

www.aviationtoday.com/am/, www.easa.eu.int/



Kinnison H.A., Aviation Maintenance Management, McGraw-Hill Professional, 2004



Kinnison H.A., Siddiqui T., Aviation Maintenance Management, Second Edition McGraw-Hill Professional, 2013

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NEXT LECTURE

1 INTRODUCTION TO AIRCRAFT MAINTENANCE

**2 STUDENTS' PRESENTATIONS (INTRODUCING
YOURSELF IN A PRESENTATION) MAINTENANCE
POLICIES**

3 AVIATION ORGANIZATIONS, AUTHORITY REGULATIONS;

4 STUDENTS' PRESENTATIONS

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