Course Outline	
Institute	Institute of Aviation Studies (IAS)
Program	BS Aviation Management
Course code	AS336
Course Title	Human Factors in Aviation
Credit Hours	03
Duration	16 Weeks
Prerequisites	AS101
Resource Person	Muhammad Nawaz Gill
Counseling Hours	Monday to Thursday 0900-1100
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Faculty Signature _____ **Date**_____

PH/COD/HOD Signature _____ **Date** _____

Dean's Signature _____ **Date** _____

Continuous Improvement			
Major Changes	**Updated By**	**Document No.**	**Date**
Development of course outline	Muhammad Nawaz Gill	AS336-V1.0-F2025	30 Sep 2025

About BS Aviation Management

Mission

Education with purpose, **D**evelopment of professional skills, **G**lobal readiness, and **E**xcellence to prepare students for success in aviation.

Program Educational Objectives (PEOs)

- **PEO 1: Industry Focus**
  Graduate is working in aviation industry, demonstrating competence to perform effectively in diverse professional roles while adapting to evolving industry practices.

- **PEO 2: Business Management**
  Graduate is taking on professional roles in business management, applying their skills to analyze, plan, and execute organizational functions effectively.

- **PEO 3: Research and Advance Studies**
  Graduate is engaging in research and advanced studies broadening their academic and professional horizons.

Program Learning Outcomes (PLOs)

- **PLO1: Analytical Thinking and Decision Making**
  Ability to interpret and analyze aviation industry problems, applying critical thinking and quantitative methods to develop solutions and make effective decisions.

- **PLO2: Effective Communication Skills**
  Ability to prepare, present, and convey ideas clearly through verbal and non-verbal communication effectively in professional contexts.

- **PLO3: Regulations, Compliance and Ethics**
  Ability to understand and evaluate regulatory frameworks, standards and safety/security practices to ensure that the operations remain ethical and compliant with national and international regulations.

- **PLO4: Business Knowledge and Entrepreneurship**
  Ability to understand the interrelated functional areas of business and use this knowledge to enhance organizational performance.

- **PLO5: Service Operations**
  Ability to run, analyze, and optimize day-to-day aviation service operations and manage related infrastructure to achieve operational excellence.

- **PLO6: Technology Integration**
  Ability to use digital tools, software applications, and information systems to support aviation operations and manage business processes.

- **PLO7: Corporate Social Responsibility**
  Ability to understand and evaluate the impact of aviation business on economic, social, and environmental aspects of society.

- **PLO8: Organizational Behavior, Leadership and Teamwork**
  Ability to evaluate organizational conflict, politics, power, and culture, while applying leadership and teamwork skills to achieve collective goals.

1. Course Description

This course provides a comprehensive introduction to the study of human performance and limitations e.g., fatigue, stress, workload within the aviation system. Students will explore how psychological, physiological, and sociological factors influence pilot, cabin crew, and maintenance performance. The course covers the application of human factors principles to minimize human error, optimize crew resource management (CRM), enhance situational awareness, and improve safety standards. Through case studies of real-world aviation incidents, students will learn to identify human factor precursors (e.g., the "Dirty Dozen"), analyze ergonomics implications and apply threat and error management (TEM) strategies. The course is also intended to incapacitate the participants to analyze aviation accidents/incidents using human factors models (e.g., SHELL Model, Reason's Swiss Cheese Model

2. Learning Methodology

The course will be delivered through a series of lectures, workshops and activity-based. This course is unique in the sense that it incorporates three assignments, one is a research assignment and the others activity-based assignment. These two assignments should help develop a research insight, fast creativity and critical thinking and above all create more interest in the course. Besides spontaneous class activities aimed to keep the participants engaged making it a useful learning source

3.Course Learning Outcomes (CLOs)

Sr.	Upon successful completion of this course, the student will be able to…	PLO Mapping	Learning Domain & level
1	Define and apply human factors concepts and theories within the context of the aviation industry	3	C1
2	Identify human performance limitations (e.g., fatigue, stress, workload) and their impact on safety-critical roles	7	C3
3	Evaluate the role of CRM in improving teamwork, communication, and decision-making on the flight deck and in the workplace.	5	C5

4. CLO – PLO Mapping

CLOs	Program Learning Outcomes (PLOs)							
	Analytical Thinking and Decision Making	Effective Communication Skills	Regulations, Compliance and Ethics	Business Knowledge and Entrepreneurship	Service Operations	Technology Integration	Corporate Social Responsibility	Organizational Behavior, Leadership and Teamwork
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
1			✓					
2							✓	
3					✓			

5. Resources

- Doc 9683-AN/950, Human Factors Training Manual First Edition — 1998
- ICAO Circular 240-AN/144 - Human Factors Digest No. 10: Human Factors in Aircraft Maintenance.
- Human Factors: Enhancing Pilot Performance by Dale Wilson (ASA) - Excellent for practical application and accident studies.
- Human Factors in Air Transport: Understanding Behavior and Performance in Aviation by Seedhouse, Brickhouse, Szathmary, & Williams (Springer). Embry-Riddle Aeronautical University

Essential Reference Material (Regulatory)

1. FAA AMT Handbook (Addendum on Human Factors - The Dirty Dozen).
2. Safer Skies Through Education - FAA - FAASTeam - FAASafety.gov
3. Safer Skies Through Education - FAA - FAASTeam - FAASafety.gov
4. Supplemental Reading & Case Studies
5. Naked Pilot: The Human Factor in Aircraft Accidents by David Beaty.
6. SKYbrary - Articles on "Dirty Dozen" and incident reports.
7. Air Accident Reports (NTSB/EASA) - Specific focus on Tenerife (1977), Colgan Air (2009), Air France 447.
8. World-wide Security-related air & ground incidents/accidents in aviation industry

6. Course Schedule

Week	Topics	Readings	Assessment	Ref of CLO
1	Introduction to Human Factors (HF) Definitions, history, and evolution of HF in aviation. The "Swiss Cheese" Model of accident causation.	Chapter 1 DOC 9683	Class discussion	1,2
2	Introduction to Human Factors (HF) Human-centered design and ergonomics in the cockpit/maintenance hangar	Chapter 2	Class activity	1.2
3	Human Performance and Limitations Information processing: Perception, memory, and cognition. Physiological limitations: Hypoxia, vision, hearing, and nutrition.	Chapter -4	Quiz 1	1
4	Human Performance and Limitations Fatigue management: Circadian rhythms, shift work, and sleep (Fatigue Risk Management Systems). Stress management: Acute vs. chronic stress, effects on performance.	Chapter 4	Assignment 1	1
5	The "Dirty Dozen" (Common Human Error Precursors) Detailed analysis of the 12 factors (e.g., Lack of Communication, Complacency, Pressure, Distraction, Norms). Application of the Dirty Dozen to real-world accidents.	Ch-4 https://skybrary.aero/articles/human-factors-dirty-dozen	Class activity2 Quiz 2	2
6	The "Dirty Dozen" (Common Human Error Precursors)	Ch-4	VIVA of assignment 1	1,2

	Detailed analysis of the 12 factors (e.g., Lack of Communication, Complacency, Pressure, Distraction, Norms). Application of the Dirty Dozen to real-world accidents.	https://skybrary.aero/articles/human-factors-dirty-dozen		
7	Error and Threat Management (TEM) Types of errors (Slips, Lapses, Mistakes) and Violations. Threat and Error Management (TEM) model: In-flight, cabin, and maintenance contexts	Ch-2 Part 2 doc 9683	Class activity 3	1,2
8	Mid – Term Assignment 2			
9	Crew Resource Management (CRM) & Communication Principles of CRM: Leadership, teamwork, and decision-making.	Ch-1 Part 2 ICAO DOC 9683	Quiz 3	1,2
10	Crew Resource Management (CRM) & Communication Assertiveness training: Challenging unsafe actions (e.g., "speak up" culture).	Ch-1 Part 2 ICAO DOC 9683	Class activity 4	2,3
11	Communication barriers: Standard phraseology, read-backs, and cultural issue sight Building Bloc in Safety management Safety v/s Reliability. Designation of risk probability & severity k	Ch-1 Part 2 ICAO DOC 9683	Assignment 3	1,
12	Organizational Factors and Safety Culture Safety Culture vs. Just Culture.	Ch1,2	Quiz 4	1

	Management responsibilities and organizational climate. Safety Management Systems (SMS) and human factors data	Part 2 doc 9683 Ch 6, part 1	Assignment 4	
13	Organizational Factors and Safety Culture Safety Culture vs. Just Culture. Management responsibilities and organizational climate. Safety Management Systems (SMS) and human factors data	Ch1,2 Part 2 doc 9683 Ch -6-part 1	Class activity 6 Viva assignment 2	2
14	Automation and Technology Human-machine interface: Trust in automation and complacency. Standard Operating Procedures (SOPs) and Checklist design.	Ch 3,4-part 2	Quiz 5	2
15	Automation and Technology Human-machine interface: Trust in automation and complacency. Standard Operating Procedures (SOPs) and Checklist design.	Ch 5,6 part 1 Doc 9683	Viva assignment 3	3
16	Viva	Assigned topics	Viva assignment 4	3
17	Final	Assigned syllabus		2&3

7. Assessments

Assessment	Weightage	Detail	Due
Quiz-1 Quiz-2 Quiz-3 Quiz-4 Quiz 5	15%	Covers Topics: book.1, Chapter1,2,3 Covers Topics: Aviation and sustainable development by ICAO Covers Topics: Loss of control -I Covers Topics: Aviation and sustainable development by ICAO	3rd session 6th session 9th session 12th session 14th session
Assignments	10%	As assigned	As assigned
Class activity total 5	10%	Research Assignment, out of the topics provided below Assignment. CA ON GIVEN topics Case study with ethical Dilemma (in-class activity) Presentation, On bellow topics	4th session 5th session 7th session 10th session 15th session
Mid Exam (Written)	25%	MCQs and/or Short Essay Qs	9th session
Final Exam (written)	40 %	MCQ, short questions & case study	As per schedule

8. Course Assessments	
Assessment Details	**Target CLOs**
A. Activities	
Intentionally left blank. Contact resource person for this section.	
B. Assignments (Rubric is attached in Appendix B)	
Intentionally left blank. Contact resource person for this section.	
C. Project/Presentation (Rubric is attached in Appendix C)	
Intentionally left blank. Contact resource person for this section.	

9. Mapping of Assessments with CLOs

CLOs	Assessments											
	Quiz 1	**Quiz 2**	**Quiz 3**	**Class Activity 1**	**Class Activity 2**	**Class Activity 3**	**Assignment 1**	**Assignment 2**	**Assignment 3**	**Project/ Presentation**	**Mid Term**	**Final Term**
1	✓			✓			✓			✓	✓	✓
2		✓			✓			✓		✓	✓	✓
3			✓			✓			✓	✓	✓	✓

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 and unethical to be texting or calling during the class.

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 **75% attendance** is required for a participant to be eligible to sit in the final examination. 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.

UMT–LMS: Participants should regularly visit the LMS and fully benefit from its capabilities. If you face any issue regarding this, contact the resource person or email your query to lms.support@umt.edu.pk for assistance.

Anti-harassment Policy: Sexual or any other harassment is prohibited and is constituted as punishable offence. All actions categorized under this policy when done physically or verbally would also be considered as harassment even by 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: Similarity report on every assignment either big or small will be checked and only 19% overall and 5% from a single source is allowed. Any student who attempts to bypass this will receive negative marking which will count towards the CGPA.

Use of Generative AI Policy: Use of Generative AI tools is permitted up to 5% for language enhancement only. Each report must include the following declaration:

"During the preparation of this work, the author(s) used [Gen AI Tool Name] to [purpose: e.g., improve language, format references, generate ideas]. The content has been reviewed, edited, and verified by the author(s), who take full responsibility for the submitted material."

In case of violation, penalties include (1) First-time failure to disclose Gen AI usage: verbal warning and resubmission, (2) Full AI-generated submissions may face grade penalty and/or disciplinary hearing, (3) Repeated misconduct may lead to the suspension from academic activities for one or more semesters, revocation of degree (after investigation), or listing of student name on the HEC/UMT academic misconduct records page.

Course Withdrawal Policy: Students may withdraw from a course till the end of the 15th 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.

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 participants about their performance in a particular assessment within a week of conducting that assessment.

Appendix A

Cover Page for Assignment

Assignment Title

Assignment Number

Student Names:

Students IDs:

Subject Name:

Section:

Name of Resource Person:

Due Date:

BS. Aviation Management

Institute of Aviation Studies (IAS)

University of Management & Technology (UMT), Lahore

Appendix B

Rubric for Assignment

Dimensions/ Weight	**Does Not Meet Expectations** (0-1 points)	**Meets Expectations** (2-3 points)	**Exceeds Expectations** (4-5 points)	**Score**
1. Understanding of Core Concepts	Demonstrates minimal understanding of airport planning and management principles; major inaccuracies present.	Demonstrates adequate understanding; some minor inaccuracies or incomplete explanations.	Demonstrates strong conceptual clarity and critical understanding with relevant and accurate examples.	/5
2. Application and Analysis	Limited or no application of course concepts; analysis lacks depth or logical flow.	Applies course concepts correctly to some extent; analysis is sound but lacks depth or innovation.	Effectively applies and analyzes airport management principles in a clear, logical, and insightful manner.	/5
3. Organization, Structure, and Clarity	Disorganized, lacks logical flow, poor formatting, and unclear writing.	Organized and generally coherent; writing is mostly clear with some structural issues.	Well-organized, coherent, and polished writing; excellent flow and logical argumentation.	/5
4. Research and Referencing	Few or no credible sources; referencing is incomplete or inconsistent; lacks citation format.	Adequate use of credible sources; mostly consistent referencing in acceptable format (APA or Harvard).	Extensive use of credible and current sources; accurate and consistent referencing throughout.	/5
5. Originality and Compliance with Academic Integrity	Similarity >19% overall or >5% from a single source; evidence of plagiarism or attempts to bypass similarity check.	Similarity ≤19% overall and ≤5% per source; properly paraphrased and referenced.	Similarity ≤10% overall; clear originality and paraphrasing; reflects authentic independent work.	/5
6. Responsible Use of Generative AI	AI use exceeds 5% or declaration missing; evidence of full AI-generated work.	AI use ≤5% for language enhancement only; declaration included.	Minimal or no AI use; clear evidence of student-authored content; declaration properly added.	/5
Total 100%	**Content Criteria**			30

Appendix C

Rubric for Presentation

Dimensions	Requirement	Individual Score					Average Score
		1	2	3	4	5	
Delivery	Speed, eye contact, clarity, audibility, tone	/10	/10	/10	/10	/10	
Content	Sets out relevant topics, confident with material, aids understanding	/10	/10	/10	/10	/10	
Structure	Logical, easy to follow, provides headings, each section relates to overall purpose	/10	/10	/10	/10	/10	
Use of visual aids	Uses of other visual aids, relevant to content.	/10	/10	/10	/10	/10	
Individual Viva	Answer to the questions	/10	/10	/10	/10	/10	
	Total Score	/50	/50	/50	/50	/50	