



Course Outline	
Institute	Institute of Aviation Studies (IAS)
Program	BS Aviation Management BS Aircraft Maintenance Engineering Technology
Course code	AM424 / AS 310
Course Title	Aviation Research Methods
Credit Hours	03
Duration	16 Weeks
Prerequisites	Statistical Inference
Resource Person	Prof. Dr. Ahmad Aizaz
Counseling Slots	Mon: 4 Tue: 3-4 Wed: 4 Thu: 3-4 Friday: 3
Contact Details	Email: ias.dean@umt.edu.pk
Website	www.ias.umt.edu.pk

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	Prof. Dr. Ahmad Aizaz	AM424-V6.0-F2025	Oct 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 will help you understand and select appropriate tools needed to conduct research: whether it relates to a project in the aviation industry or there is a question, you have always wanted to answer, a puzzle you want to solve, or a program / product you want to evaluate. Research isn't just for academics and scientists: it is for everyone. You will learn guidelines and systematic methods, that will show you the value of knowing the ins and outs of research in your everyday life and give you the tools to answer questions both large and small. You will also learn to appreciate the difference between an Essay writing, which you have been doing up until now, and the formal research report writing. You will discover what sound practice in research looks like, and be able to see whether others follow. You will need to follow the path of ethics in research, Topics will quickly become research questions, and thoroughly reviewing the literature will help crystalize the hypotheses, theories, and other ideas that will allow you to start designing your research project. The best part is, you don't need to have strong mathematic or science skills to do any of this. Only that your prior concepts of Statistics that you learned earlier in the program shall be sufficient to apply them in this course. By the end of this course, you will have the tools needed to start your next stage in life as a full-fledged researcher.

2. Learning Methodology

The course will be delivered through a series of lectures aided with classroom activities. The Activity based learning and an Ethical dilemma / Scenario shall help you develop skills in critical thinking and research insight, fostering creativity and independence, and above all, create more interest in the course. You are required to refresh your knowledge on Statistics as quickly as possible since some practical activities and assessments in this course shall depend on this knowledge. Your skills in using MS Excel will be required to undertake such assessments. A class project (written report along with presentation) is also embedded in the course that shall help you not only consolidate your overall learning of the course but also to demonstrate this learning.

3. Course Learning Outcomes (CLOs)				
Sr.	Upon successful completion of this course, the student will be able to...	PLO (BSAM)	PLO (AMET)	Learning Domain & level*
1	Show understanding of the main ideas, terminologies, and issues to consider in conducting effective aviation research.	4	4	C2
2	Show understanding of role of ethics in research	3	8	C2
3	Analyze data using Computer software (MS Excel)	6	2	C4

4. CLO – PLO Mapping (BSAM)								
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						✓		
		✓						

CLOs	PLOs											
	Engineering Technology 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				✓								
2								✓				
3			✓									
4										✓		

5. Resources

A. Text Books

- “Effective Research Methods for Any Project” by Professor Amanda M. Rosen.(Free pdf is available on your LMS + Video Lectures shall also be made available on LMS)
- “An Introduction to Business Research Methods” by Dr Sue Greener & Dr Joe Martelli.(Free pdf is downloadable from bookboon.com) <https://research-methodology.net/>

B. Web Links

- ICAO Accident Statistics: <https://www.icao.int/safety/iStars/Pages/Accident-Statistics.aspx>
- ASN database: <https://aviation-safety.net/database/databases.php>
- On-Time Arrival Performance National (April, 2020):
https://www.transtats.bts.gov/OT_Delay/OT_DelayCause1.asp
- NTSB database: https://www.nts.gov/_layouts/nts.gov/aviation/index.aspx
- Sample t-test
 - <https://www.youtube.com/watch?v=VPd8DOL13Iw>
 - <https://youtu.be/-4QorcLfkyc>
 - <https://youtu.be/qvPWQ-e03tQ>
- Anova 1-Way:
 - <https://www.youtube.com/watch?v=0GyMB6D3R7U>
 - https://www.youtube.com/watch?v=_VFLX7xJuqk
- 2-Way Anova Using Excel
 - <https://youtu.be/hPG8IvKMXoc>
 - <https://youtu.be/ajLdnsLPErE?list=PLWtoq-EhUJe2TjJYfZUQuq7a0dQCnOWp>
- Correlation and regression: <https://www.youtube.com/watch?v=xTphD5WLuoA>

6. Schedule			
Weeks	Course Content	Reference Book	CLO
1	Introduction, Course Description, Why Research Matter?	Ch 1	1
2	Characteristics of Good Research & Doing Research Ethically. (Quiz No-1)	Ch 2 & 3	2
3	What's Already Known? The Literature Review (Class Activity- Literature Review) (Assignment No 1: Literature Review)	Ch 3 & Ch 5	4
4	Generating Hypothesis and Theories. (Quiz No-2)	Ch 6 & Ch 7	1
5	Measuring Concepts and Phenomena Choosing Populations, Samples, and Cases (Assignment No 2: Measuring concepts)	Ch 8 & Ch 9	1
6	The Classic Experiment (Class Activity- Classic Experiment) The Value of Quasi Experiments (Quiz No-3)	Ch 10 & Ch 11	1
7	Designing and Conducting Survey (Class Activity: Survey Questionnaire) (Assignment No 3: Developing Survey Questionnaire) (Group Research Project Announcement)	Ch 12	1, 3, 4
8	Understanding Election Polls (Quiz No-4) Research by Case Study	Ch 13, Ch 14	1
9	(MID TERM - Time 01 time slot) Interpretivism and Field Research	--- Ch 15	2,4 1

10	Interpretivism and Field Research Cont'd Applied, Evaluative, and Action Research (Optional Quiz No - 5)	& Ch 16	1
11	Gathering and Preparing Data Using Statistics to Interpret Data (Class Project: Application of Statistics on Research Data)	Ch 17 & Ch 18	3
12	Statistical Inferences from Data (Selected topics) Assessing Correlation and Causation (Selected topics)	Ch 19 & Ch 20	3
13	The Art of Presenting Your Findings	Ch 24	4
14	Class Discussion on Assignments & Research Project		3,4
15	(Project report submissions) Presentations Research Project		4
16	Revision of course		
17	Final Exam		1,3,4

7. Evaluation Criteria and Weightages			
Assessments	Assessments	Weightages (%)	Details
Quizzes	4	15%	Topic/s for each quiz will be announced.
Assignments	3	10%	Relevant to the ongoing lecture, activities, assignments and projects.
Mid Term Examination	3	25%	Assignment topics will be announced.
Class Participation	1	5%	Will be announced.
Project Report	1	5%	Syllabus for mid-term exam will be announced in 6 th week.
Project Presentation	1	5%	Syllabus for final-term exam will be announced in 14 th week.
End Term Examination	1	35%	Will be announced.

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	Quiz 4	Assignment 1	Assignment 2	Assignment 3	Class Participation	Mid Exam	Project Presentation n	Project Report	Final Term	
1	✓		✓	✓					✓			✓	
2		✓					✓	✓	✓				
3						✓						✓	
					✓				✓	✓	✓		

10. Policies

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	