Jordan University of Science and Technology

Faculty of Engineering

Aeronautical Engineering Department

AE576 Aircraft Navigation
Second Semester 2023-2024

Course Catalog
3 Credit Hours. Fundamentals of aircraft navigation systems, Inertial navigation system (INS) principles, Global Positioning System (GPS) principles, Radio navigation systems, Air data based navigation systems, Least squares estimation and Kalman filtering for optimal estimation of stochastic systems
Teaching Method: Blended

Text Book	
Title	Avionics Navigation Systems
Author(s)	Myron Kayton and Walter R. Fried
Edition	2nd Edition
Short Name	Kayton
Other Information	

Instructor	
Name	**Dr. KHALED ALJANAIDEH**
Office Location	-
Office Hours	
Email	kfaljanaideh@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue : 11:30 - 12:30 Room: E2114

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
713700	AE370 Instrumentation	Prerequisite / Study
714640	AE464 Automatic Control	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Weeks 1, 2	Introduction	
Weeks 2, 3, 4	Mathematical review	
Weeks 5, 6, 7, 8	Global Positioning System (GPS) principles	
Weeks 9, 10, 11, 12	Inertial navigation systems (INS) principles	
Weeks 13, 14, 15	Airdata-based and radio navigation systems	
Weeks 15, 16	State estimation and Kalman filtering with application to navigation	
Weeks 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	MATALB basics and course projects (online lectures)	

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Know basics of mathematics used in navigation systems analysis [10SO1, 10SO6]	20%	
Design and analysis of inertial navigation systems [5SO1, 5SO2, 3SO5, 5SO6]	20%	
Know basics of global navigation satellite systems [7SO1, 5SO2, 5SO5, 8SO6]	20%	
Know basics of least squares estimation, Kalman filtering, and optimal estimation [5SO1, 5SO2, 5SO6]	20%	
Be familiar with airdata-based and radio navigation systems [5SO2, 5SO6]	20%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
27.82	26.22			7.33	38.62	

Evaluation	
Assessment Tool	**Weight**
First Exam	20%

Second Exam	20%
GPS Project	10%
INS Project	10%
Final Exam	40%

Policy	
Project policy	Conceptual discussion is allowed. However, all substantive work must be your own.
Classroom rules	No excessive talking; no eating; no open laptops; no texting; no smart phone usage for any reason.

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