



The Hashemite University
Faculty of Engineering
Course Syllabus

Course Title:	Satellite Communication	Course Number:	110409428
Department:	Electrical Engineering	Designation:	Compulsory Elective
Prerequisite(s):			
Instructor:	D. Ashraf A. Ali	Instructor's Office:	Eng. 3057
Instructor's e-mail:	ashraf@hu.edu.jo	WEB:	
Office Hours:	Sun Tue Thu 10-11 AM		
Time:	Sun Tue Thu 8-9 AM	Lecture Hall	Distance- Learning
Course description:	Introduction to the fundamentals of satellite communication systems and its evolution throughout history. Discuss the satellite network architectures and its features and functionality. Discuss the Microwave link engineering for satellite systems and the physical layer communication aspects, such as the modulation, Multiple access, and impairments. Present the earth stations and network technologies.		
Textbook(s):	<ul style="list-style-type: none"> - Introduction to Satellite Communication, 3rd edition, Bruce R. Elbert - Satellite Communications Systems, Techniques and Technology 5th Edition Gerard Maral and Zhili Sun - 		
Other required material:	Lectures notes, PowerPoint slides, external links		
Course objectives:	<p><i>The student should be able to:</i></p> <ol style="list-style-type: none"> 1. study satellite communication systems and its requirements 2. study the orbits of satellite systems and its motion characteristics. 3. Study satellite architectures for different systems 4. understand baseband signals and its requirements. 5. study the satellite networks architecture and its related protocols and models. 6. study satellite onboard connectivity. 7. study broadcast satellite concepts . 8. Understand Transmission Control Protocol for satellite systems. 9. Study Earth Stations and its characteristics. 		
Topics Covered	<ol style="list-style-type: none"> 1. Development of satellite communications 2. Types of orbit 3. Radio regulations 4. Kepler's and Newton's laws 5. Earth-satellite geometry 6. Data and multimedia signals 7. Delay in terrestrial network 8. Baseband Formatting and Digital Modulation 9. End-to-end error control 10. Multiple access in satellite systems 11. Open Systems Interconnection (OSI) reference model 12. Reference architecture for satellite networks 		

	13.Connectivity through intersatellite links (ISL) 14.Overview of DVB-RCS and DVB-S/S2 network 15.Satellite MAC layer									
Class/laboratory schedule:	3 class sessions every week; 45 minutes each.									
Grading Plan:	<table> <tr> <td>Project+presentation</td> <td>30 Points)</td> <td>To be announced later</td> </tr> <tr> <td>Mid Exam</td> <td>30 Points)</td> <td>To be announced later</td> </tr> <tr> <td>Final Exam</td> <td>(40 Points)</td> <td>Will be announced by the registrar</td> </tr> </table>	Project+presentation	30 Points)	To be announced later	Mid Exam	30 Points)	To be announced later	Final Exam	(40 Points)	Will be announced by the registrar
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General Notes:	Will be confirmed later following COVID-19 guidelines									