

Engineering Electromagnetics (MEE 2310)

الكهرومغناطيسية الهندسية (هكت 2310)

Course:	Code:	MEE 2310	Instructor:	Name:	Dr. Ali H. Alqahtani
	Credit Hours:	3(3,1,0)		E-mail:	ahqahtani@ksu.edu.sa
	Level:	6		Website:	http://fac.ksu.edu.sa/ahqahtani
	Pre-requisites:	MATH 1110, PHYS 1220		Office:	1 st floor, F-071
	Section #	505		Office hour:	See my website
Text Books & References:	1-Elements of Electromagnetics, by Matthew N.O. Sadiku, 5 th Ed., Oxford University Press, USA, 2009. 2-Engineering Electromagnetics, by W. Hayt and J. Buck, McGraw Hill, 2012.				
Main Topics & Scheduled contact	<p>Main topics:</p> <ul style="list-style-type: none"> • Transmission lines: time and space dependence of signals, line parameters, input impedance, use as circuit elements, reflection coefficient, standing wave ratio, transient behavior. • Impedance matching: transformers, stubs, analysis using the Smith Chart. • Maxwell's equations. • Electromagnetic waves: TEM, TE, TM propagation. • Waveguides: basic equations, parallel plate guide, rectangular guide. • Antennas <p>The topics are distributed as following:</p> <ol style="list-style-type: none"> 1. Vector analysis (1,3) 2. Review of Electrostatics and Magnetostatics (1,3) 3. Transmission lines: Transmission line model, equation, and lossless propagation (1,3) 4. Input impedance, reflection coefficient and standing wave ratio of finite length loaded transmission line (1,3) 5. Smith chart and its use to solve loaded transmission line problems (1,3) 6. Transient Analysis (1,3) 7. Impedance matching using smith chart (1,3) 8. Maxwell's equations and uniform plane wave (1,3) 9. Power flow in different media (1,3) 10. Wave polarization (1,3) 11. Plane wave, reflection and standing wave ratio (2,5) 12. Guided waves: Parallel plate and rectangular wave guides (2,5) 13. Antennas and radar (1,3) 				
Objectives	<ol style="list-style-type: none"> 1- Study and analyze Electromagnetic Engineering Problems. 2- Study wave equations. 3- Be familiar with applied electromagnetic engineering systems. 				
Outcomes	<ol style="list-style-type: none"> 1- Apply transmission line modelling technique to calculate input impedance, reflection coefficient, and standing wave ratio. 2- Realize the concept of transient behavior of ideal transmission lines. 3- Identify the mismatch effect and apply impedance matching concept using Smith chart (transformers and stubs as the basic elements for impedance matching). 4- Use Maxwell's equation and solve the wave equation in free space. 5- Recognize the properties of TEM waves in free space. 6- Apply the wave propagation principle in metallic guided structures: Parallel plate guide and rectangular guide. 7- Know the basic concepts of antennas and their use in communications and radar systems. 				
Grading Policy of Activities and Assessment	Assessment task	Date due	Grades	Total	
	Quizzes (5 – average mark)	During weeks 3, 6, 8, 10, 12	10%	100 %	
	Homework (3 – average mark)	End of week3, week7, week 11	10%		
	First major exam	Within the 6 th week	20%		
	Second major exam	Within the 12 th week	20 %		
	Final Exam	As scheduled by the registrar	40 %		

<p>Coursework:</p>	<ul style="list-style-type: none"> • All coursework activities including assignments and quizzes will be announced in class and online together with deadlines for submission. • Course materials including lecture notes, presentations, assignments, etc. will be posted regularly on the University Learning Management System (LMS) portal at http://lms.ksu.edu.sa • Students are required to regularly check their University emails and the online Learning System (LMS) for course announcements and assignments, in addition to the course website: http://fac.ksu.edu.sa/ahqahtani/course/234949 • All assignments should be submitted on time. Late submission will be penalized as follows: 20% off attained mark for every day late. After 5 days from the submission deadline, no assignment will be accepted and a zero mark will be recorded for the particular assignment. • Copying others' work is plagiarism which is illegal. Plagiarised assignments will not be marked and instead a zero mark will be given to all students involved. • Marked coursework will be returned to students after one week from the submission deadline. • Where practical, coursework solutions (of numerical and multiple choice nature) will be posted online one week after the submission deadline. • Students are required to check their answers against the posted solutions and immediately inform the instructor of any discrepancies they may find in their marked coursework.
<p>Attendance Policy</p>	<ul style="list-style-type: none"> • Punctual attendance of all classes is crucial for achieving the objectives and learning outcomes of this course. The correlation between attendance and performance is well established. • Attendance is compulsory for all classes including lectures and tutorials. • Any student who arrives after 10 minutes from the start of class will be considered absent. • Any student whose overall attendance in a particular course is below 75% will not be allowed to sit the final exam for that course. • Absence from tutorials will be included in the overall attendance record. • If a student misses a class due to a medical reason, then he must provide a medical certificate from a public hospital within 10 days after his return to University. The certificate must be handed to the course instructor personally. • Non-medical reasons for absence will not be accepted unless approved by the Students' Affairs.
<p>General Rules:</p>	<ul style="list-style-type: none"> • In addition to the study material posted online and recommended textbook, the students are also required to consult the other suggested references/sources on a regular basis. • Students are required to regularly check their University emails and the online Learning System (LMS) for course announcements and assignments. • Use of mobile phones or other electronic devices is not allowed during class. Unless permitted by the instructor, all such electronic devices must be switched off or put on silence during class. • Students are strongly encouraged to ask questions during lessons when prompted to do so by the instructor. If further clarification is needed, the students could consult the instructor during his assigned office hours. • Where applicable, formulas will be provided in the exams. However, students are required to understand them, recognize their relevance and know how to apply them. • Transparency, honesty and trustworthiness are expected to be upheld by both staff and students at all times. • cell phones should be turned off during class, active participation in this class is a vital part of your success. Mobile phones may be put on silent mode but using it during class is allowed. Mobile phone usage will affect the marks negatively.
<p>Make-up Policy</p>	<ul style="list-style-type: none"> • There will be no makeup for missed quizzes or unsubmitted assignments. Missed quizzes or unsubmitted assignments will receive zero marks. • Missed quizzes or unsubmitted assignments for eligible reasons will not be considered when calculating the average mark of the related coursework. • Makeup for missed exams will be done according to the University Examination Policy. Any evidence for excused absence must be submitted to the instructor within one week from the date of the missed exam.