



Course Code-Name	EE458 - WIRELESS COMMUNICATIONS
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Course Schedule	Thursday: 1 pm - 2 pm Friday: 9 am - 11 am
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Instructor's Name Phone E-mail Office Hours	Asst. Prof. Dr. Engin Masazade engin.masazade@yeditepe.edu.tr	
	<u>Office Hours</u>	
	Monday	4 - 6 pm
	Tuesday	
	Wednesday	9 - 11 am
	Thursday	11 - 12 am, 4 - 6 pm
	Friday	11 - 12 am

New: The class is on Piazza.

Find our class page at: <https://piazza.com/yeditepe.edu.tr/spring2015/ee458/home>



Assistants	
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Textbook & Supplementary Materials	<p>A. Goldsmith, Wireless Communications, Cambridge University Press, 2005</p> <p>T. Rappaport, Wireless Communications, Principles and Practice, Prentice Hall, 2nd edition. 2002</p> <p>S Haykin, M. Moher, Modern Wireless Communications, Prentice Hall, 2005</p>
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Prerequisites	EE354 - Communication Systems
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Course Outline	Week 1	Overview of Wireless Communications (A. Goldsmith)
	Week 2	The Cellular Concept – System Design Fundamentals Frequency Reuse, Handoff Strategies, Interference and System Capacity (T. Rappaport,)
	Week 3	The Cellular Concept – System Design Fundamentals Trunking and Grade of Service (T. Rappaport,)
	Week 4	The Cellular Concept – System Design Fundamentals Exercises (T. Rappaport,)
	Week 5	Path Loss and Shadowing (A. Goldsmith)
	Week 6	Statistical Multipath Channel Models: Narrowband fading models. (A. Goldsmith)
	Week 7	Statistical Multipath Channel Models: Wideband fading models. (A. Goldsmith)
	Week 8	MIDTERM
	Week 9	Review of Digital Modulation and Detection, Signal Space Analysis
	Week 10	Performance of Digital Modulation over Wireless Channels: AWGN Channels (A. Goldsmith)
	Week 11	Fading and Outage Probability (A. Goldsmith)
	Week 12	Multicarrier Modulation – OFDM (A. Goldsmith)
	Week 13	Diversity Techniques (If time permits) (A. Goldsmith)
	Week 14	Introduction to Wireless Networks (Seminar)

Midterm Date	Midterm: Week 8, Friday - 2 hour (Open note and textbook - The notes should be your OWN handwritten notes, using the lecture notes of others or photocopied notes are prohibited.)
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Grading		Percentage	Note
	Midterm	30 %	Allowed time: 120 minutes
	Research	30 %	



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Paper/Project		
Final	40 %	Allowed time: 150 minutes

Students can work either individually or in a group of two. Research paper can be a literature survey or a system implementation with simulation results or hardware. Research papers without any simulation results may get maximum 70 % credit.

PLAGARISM is strictly prohibited and may subject to faculty investigation.

“Examples of student plagiarism include submitting a paper not written by the student, quoting or paraphrasing text without citing the original source, fabricating data, creating false references in a bibliography or proposing an idea as “original” when another source proposed it first.”

<http://tlt.psu.edu/plagiarism/instructor-guide/defining-plagiarism-and-academic-dishonesty/>

Research paper grading	
Topic selection	5 % (Title Selection deadline: The week after Midterm) Write a one-page report and motivate why you want to work on the suggested topic.
Content of the research paper.	45 %
Quality of the research	30 %



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	<table border="1"> <tr> <td>paper presentation.</td> <td>(Paper body, quality of the references, conclusions, simulation results, handling references, presenting equations, figures)</td> </tr> <tr> <td>Paper presentation skills</td> <td>20 % (Confidence in presentation, mastering the material)</td> </tr> </table>	paper presentation.	(Paper body, quality of the references, conclusions, simulation results, handling references, presenting equations, figures)	Paper presentation skills	20 % (Confidence in presentation, mastering the material)
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Paper presentation skills	20 % (Confidence in presentation, mastering the material)				
Attendance	<ul style="list-style-type: none"> ▪ 80 % (If your lecture attendance falls below 80%, you <u>FAIL</u> the class (FA) and have <u>NO</u> right to take the Final make-up exam.) 				
Course Objectives	<p>i. Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.</p> <p>ii. Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.</p> <p>iv. Ability to devise, select, and use modern techniques and tools needed for engineering practice; ability to employ information technologies effectively.</p> <p>vi. Ability to work efficiently in intra-disciplinary and multi-disciplinary teams; ability to work individually.</p> <p>ix. Awareness of professional and ethical responsibility.</p>				

Course Outcomes

(Note to instructor: Please list only those outcomes that your course serves)

- i. **Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.**
(Matematik, fen bilimleri ve kendi dalları ile ilgili mühendislik konularında yeterli bilgi birikimi; bu alanlardaki kuramsal ve uygulamalı bilgileri mühendislik problemlerini modelleme ve çözme için uygulayabilme becerisi.)
- ii. **Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.**



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- (Karmaşık mühendislik problemlerini saptama, tanımlama, formüle etme ve çözme becerisi; bu amaçla uygun analiz ve modelleme yöntemlerini seçme ve uygulama becerisi.)
- iii. **Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose. (Realistic constraints and conditions may include factors such as economic and environmental issues, sustainability, manufacturability, ethics, health, safety issues, and social and political issues, according to the nature of the design.)**
(Karmaşık bir sistemi, süreci, cihazı veya ürünü gerçekçi kısıtlar ve koşullar altında, belirli gereksinimleri karşılayacak şekilde tasarlama becerisi; bu amaçla modern tasarım yöntemlerini uygulama becerisi. (Gerçekçi kısıtlar ve koşullar tasarımın niteliğine göre, ekonomi, çevre sorunları, sürdürülebilirlik, üretilebilirlik, etik, sağlık, güvenlik, sosyal ve politik sorunlar gibi öğeleri içerirler).)
- iv. **Ability to devise, select, and use modern techniques and tools needed for engineering practice; ability to employ information technologies effectively.**
(Mühendislik uygulamaları için gerekli olan modern teknik ve araçları geliştirme, seçme ve kullanma becerisi; bilişim teknolojilerini etkin bir şekilde kullanma becerisi.)
- v. **Ability to design and conduct experiments, gather data, analyze and interpret results for investigating engineering problems.**
(Mühendislik problemlerinin incelenmesi için deney tasarlama, deney yapma, veri toplama, sonuçları analiz etme ve yorumlama becerisi.)
- vi. **Ability to work efficiently in intra-disciplinary and multi-disciplinary teams; ability to work individually.**
(Disiplin içi ve çok disiplinli takımlarda etkin biçimde çalışabilme becerisi; bireysel çalışma becerisi.)
- vii. **Ability to communicate effectively both orally and in writing; knowledge of a minimum of one foreign language.**
(Sözlü ve yazılı etkin iletişim kurma becerisi; en az bir yabancı dil bilgisi.)
- viii. **Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.**
(Yaşam boyu öğrenmenin gerekliliği bilinci; bilgiye erişebilme, bilim ve teknolojideki gelişmeleri izleme ve kendini sürekli yenileme becerisi.)
- ix. **Awareness of professional and ethical responsibility.**
(Mesleki ve etik sorumluluk bilinci.)
- x. **Information about business life practices such as project management, risk management, and change management; awareness of entrepreneurship, innovation, and sustainable development.**
(Proje yönetimi ile risk yönetimi ve değişiklik yönetimi gibi iş hayatındaki uygulamalar hakkında bilgi; girişimcilik, yenilikçilik ve sürdürülebilir kalkınma hakkında farkındalık.)
- xi. **Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety; awareness of the legal consequences of engineering solutions.**
(Mühendislik uygulamalarının evrensel ve toplumsal boyutlarda sağlık, çevre ve güvenlik üzerindeki etkileri ile çağın sorunları hakkında bilgi; mühendislik çözümlerinin hukuksal sonuçları konusunda farkındalık.)