

COURSE RECORD

Code	ECE 529
Name	Next Generation Mobile Communication Systems
Hour per week	3 (3+0)
Credit	3
ECTS	7.5
Level/Year	Graduate
Semester	Spring
Type	Elective
Prerequisites	None
Description	This course aims to provide key concepts and enabling technologies for next-generation mobile communication systems as well as the potential benefits and challenges that may arise when implementing them in the next generation of mobile and wireless systems (e.g. 5G and beyond). This course helps students to understand the practical, theoretical and technological sides of the evolving communication technologies and key ideas that will influence the next generation of mobile and wireless communication systems. In addition, this course is designed in a way to enhance their skills for working in industry or their knowledge to conduct a research degree in this field.
Objectives	Describing the fundamentals of wireless and mobile communications. Explaining key enabling technologies and network architectures which shape the next-generation communication networks. Demonstrating performance analysis of advanced mobile communication techniques and algorithms in simulation environment. Presenting how to transfer communication knowledge and software skills to enable industrial applications.
Learning Outcomes	<i>By the end of the course, the student will be able to:</i> LO1. Explain the key principles of mobile communication systems LO2. Identify the key new generation wireless technologies, their necessity, and their potential to influence future communication systems. LO3. Analyze various design options for next generation wireless communication systems and enabled applications. LO4. Demonstrate the ability to design and verify various concepts and applications in simulation environments.

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6
LO1	5	4	0	0	4	0
LO2	5	4	0	0	4	0
LO3	5	5	5	0	5	0
LO4	5	5	5	5	5	5

*Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

COURSE CONTENT DETAILS

Topic	Outcomes
Wireless and Mobile Communications Overview	L01 L02
Future Wireless Evaluation and Standards (e.g. 5G New Radio)	L02 L03
5G New Radio	L02 L03 L04
mmWave Communications, Massive MIMO and Beamforming	L02 L03 L04
Machine Learning for Wireless Communications	L02 L03 L04
Vehicular Communications	L02 L03 L04
Towards 6G Wireless Systems	L02 L03 L04

DERS BİLGİLERİ

Kodu	ECE 529
İsmi	Yeni Nesil Mobil Haberleşme Sistemleri
Haftalık Saati	3 (3+0)
Kredi	3
AKTS	7,5
Seviye/Yıl	Lisansüstü
Dönem	Bahar
Dersin Dili	İngilizce
Tip	Seçmeli
Ön Şart	Yok
İçerik	Bu ders, yeni nesil kablosuz haberleşme sistemleri için temel kavramlar ve olarak sağlayan teknolojilerin yanı sıra bunların yeni nesil mobil sistemlerinde (örneğin 5G ve ötesi) uygulanmasında ortaya çıkabilecek potansiyel fayda ve zorlukları sunmayı amaçlamaktadır. Bu ders, öğrencilerin gelişen haberleşme teknolojilerinin pratik, teorik ve teknolojik yönlerini ve gelecek nesil mobil ve kablosuz iletişim sistemlerini etkileyecek temel fikirleri anlamalarına yardımcı olur. Ayrıca, öğrencilerin bu alanda endüstride çalışma becerilerini ve araştırma derecesi yürütme bilgilerini geliştirecek şekilde için tasarlanmıştır.