



OPUS
College of Engineering

MARQUETTE UNIVERSITY

ELEN 4590/EECE 5590 FALL 2020
**Developments in Communications:
Modern Wireless Communication**



image courtesy: Proxim, Connectivity Wireless, threatpost.com, and Siradel.

COURSE CONTENTS

- 📖 Wireless Channels
- 📖 Channel Capacity
- 📖 Digital Transmission
- 📖 MIMO Communication
- 📖 Multi-carrier and OFDM
- 📖 Multiple Access
- 📖 Cellular System Basics
- 📖 Introduction to 5G Techniques

PROJECT INFORMATION

💡 Optional Formats:

- ⬆ Simulation
- ⬆ Survey
- ⬆ Implementation
- ⬆ Analysis

💡 Example Topics:

- ⬆ Software-define Radio
- ⬆ Low-power Wide-area Network (e.g., LoRa)
- ⬆ Narrowband Internet of Things (NB-IoT)
- ⬆ Vehicle-to-vehicle Network
- ⬆ Aerial Wireless Communication

Or Propose Your Own Topic

📶 From the smoke signals in ancient times to the **upcoming 5G**, communications have been playing a significant role in civilization. In the future, wireless communications will become ubiquitous and connect everyone and everything.

📶 In this course, we will learn the **fundamentals** that enable modern wireless communications (e.g., Wi-Fi, cellular). The course project will cover topics on **modern** communication techniques, e.g., vehicle-to-vehicle communications.

📶 In this course, we will discuss the **challenges and solutions** in modern and next-generation wireless communications and understand the role of wireless communications in the era of the Internet of Things.

📋 **Prerequisites:**
Discrete-time signals, Fourier transform, Probability and random process.

👤 **Instructor:**
Dr. Jie Gao, ECE, Marquette University.