



## **Advanced Mobile Communications Standards, System Designs and Protocols ENPM808B Spring 2022**

### **Course Overview**

This course provides an in depth understanding of advanced technologies and design principles applied in the development of latest 4G/LTE, 5G New Radio (NR) wireless systems and standards. Topics related to spectrum management, radio and physical channelization, physical layer procedures, media, radio link control MAC/RLC layer and radio resource control (RRC) signaling, mobility and security management as well as some network architecture and deployment tradeoffs are addressed. The course maps the reviewed system and network design principles to their specific realizations in the evolution of wireless technologies up to and beyond 5G systems.

### **Tentative Schedule:**

- Week 1: Overview of Standardization Process up to and Beyond 5G
- Week 2: Overview of 4G/5G Component Physical Layer Technologies
- Week 3: Overview of 4G/5G Component MAC/RRC Technologies
- Week 4: Review of UMTS/HSPA systems
- Week 5: Exam 1
- Week 6: LTE System Architecture and Protocol Architecture
- Week 7: LTE Physical Layer Channels and Procedures
- Week 8: LTE Resource Allocation and Signaling
- Week 9: LTE System Access and Mobility Management
- Week 10: Exam 2
- Week 11: 5G New Radio (NR) System Architecture & Protocol Architecture
- Weeks 12, 13: 5G NR Physical Layer Channels and Resource Allocation
- Week 14: 5G NR System Access, Signaling Protocols and Mobility Management
- Week 15: Exam 3

### **Course Grading:**

Three Exams, %25 each plus %25 Course Project.

### **References Books/Reading:**

Recommended Text: 4G: LTE/LTE-Advanced for Mobile Broadband, 2nd Edition, by Erik Dahlman, Stefan Parkvall, Johan Skold, Per Beming.

ISBN- 978-0-12-419985-9 Publisher: Academic Press

Required: Slides/Class Notes will be provided.

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### **Class Meets**

Mondays 4-6:40pm

Location: TBA

### **Office Hours**

Fridays 1-3pm

Phone (301) 538-7180

or Webex/Zoom:

and by appointment

### **Teaching Assistants**

N/A

### **Prerequisites**

ENPM616 or Equivalent  
with permission of  
instructor.

### **Course Communication**

Emails and File Sharing  
Through ELMS/Canvas.