Tentative DAT610 Syllabus

Topic	*Textbook*
	Wireless communication networks and systems 5G wireless: a comprehensive introduction
Technological Background	
• Communication Networks	
○ Networking	3.1–3.4
○ Protocol	4.1–4.3
○ Internetworking	4.4
• Wireless Network Taxonomy	
○ Ad-hoc Networking	
○ Cellular Networking	
○ Sensor Networks	
○ Mesh Networks	
Physical Layer	
• Signal	2.1
• Transmission Media	2.4
• Antenna	5.1, 5.2, 6.1, 12.2, 12.3, 12.4
• Wireless Channel	2.3, 5.1-5.3, 6.2-6.4 11.1, 11.2, 11.3, 11.4
• Modulation & Encoding	5.5, 7.1-7.4, 12 13.1
• Multiplexing & Duplexing	2.5
• Channel Correction Mechanisms	5.4, 6.5 12.1
Data Link Layer (MAC)	
• CSMA	
• CDMA	5.8, Ch. 9
• OFDMA	5.7, Ch. 8 13.2
Data Link Layer (LLC)	
• Error Detection	5.6, 10.1 14.3
• Automatic Repeat Request	5.6, 10.4
• Error Correction	
○ Block Codes	5.6, 10.2 14.2, 14.4

- Convolutional Codes — 5.6, 10.3

Network Layer

- Internet Protocol
  - Packet/Address — Appendix 4A
  - Routing
  - Mobility — 15.4
  - Quality of Service — 3.5

Transport Layer

- Transmission Control Protocol (TCP) — Appendix 4B
- User Datagram Protocol (UDP) — Appendix 4C
- Transport Layer in Wireless Networks

WPAN

- Bluetooth — 12.2-12-4
- IEEE 802.15.3 — 12.5
- ZigBee — 12.6
- 6LoWPAN

WLAN — 11.1

- IEEE 802.11 — 11.3-11.8

LP-WAN

- LoRa
- NB-IoT
- LTE-M

Cellular Networks

- Principles of Cellular Networks — 13.1
  1.2
- 2G — 13.3
  1.4
- 3G — 13.5
  1.5
- 4G — Ch. 14
  1.6
- 5G — Ch. 2, Ch.3, Ch. 9, Ch15

Wireless Security