

Course Content

Course Title (English)	Mobile Communications
Course Title (Chinese)	行動通訊
Credit	3
Instructor	Prof. Kwang-Cheng Chen 陳光禎 教授
Outline	<ul style="list-style-type: none">1.Fundamentals of Mobile Communications<ul style="list-style-type: none">1.1. Basic Digital Communication Theory1.2. Mobile Communication Engineering1.3. Digital Cellular Systems<ul style="list-style-type: none">1.3.1. GSM, GPRS, and EDGE1.3.2. Spread Spectrum, CDMA, and Multiuser Communications1.3.3. IS-951.3.4. WCDMA and HSPA1.3.5. 3GPP2*1.3.6. TD-SCDMA*1.4. IEEE 802 Systems<ul style="list-style-type: none">1.4.1. IEEE 802.111.4.2. IEEE 802.15 and Bluetooth1.4.3. IEEE 802.161.5. Network Security2.Orthogonal Frequency Division Multiple Access (OFDMA)<ul style="list-style-type: none">2.1. Principles of Orthogonal Frequency Division Multiplexing2.2. OFDM Systems<ul style="list-style-type: none">2.2.1. Receiver Design

	<ul style="list-style-type: none"> 2.2.2. IEEE 802.11a/g 2.2.3. MB-OFDM, WiMedia, and Bluetooth 3.0 2.3. MIMO OFDM <ul style="list-style-type: none"> 2.3.1. Beamforming 2.3.2. Spatial Multiplexing 2.3.3. Space-Time Codes 2.3.4. MIMO OFDM 2.3.5. IEEE 802.11n 2.4. OFDMA 2.5. MIMO OFDMA 2.6. Mobile WiMAX 2.7. Broadband Cellular <ul style="list-style-type: none"> 2.7.1. IEEE 802.16m 2.7.2. IMT-Advance 2.7.3. 3G LTE and UMB 3. Technology toward 4G Wireless <ul style="list-style-type: none"> 3.1. Cooperative Communications 3.2. Cognitive Radio Networks <ul style="list-style-type: none"> 3.2.1. Software Radio and Re-configurable Networks 3.2.2. Spectrum Sensing 3.2.3. Dynamic Spectrum Access 3.2.4. Network Layer Structure 3.2.5. Trust and Security <p>* may not be included if time is not allowed.</p>
Goal	<p>This course provides systematic introduction about fundamental mobile communication systems/networks/architecture. Focusing technologies in this</p>

	<p>year will be fundamentals of cellular communications, OFDM-based wireless broadband communications (wireless local area networks, wireless personal area networks, and mobile WiMAX), and technology toward 4G wireless. The course suitable for 1st or 2nd year graduate students and senior undergraduate students will be presented in English in different aspects: conceptual orientation, theoretical framework and analysis, and system design.</p>
English Teaching	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
Teaching Material	<input checked="" type="checkbox"/> English <input type="checkbox"/> Chinese