Mobile Communications – Telecommunication Networks

<table>
<tr><th>module title
module code</th><th colspan="3">level of module</th><th>year of study</th><th>semester/trimester when the module is delivered</th></tr>
<tr><td>Mobile Communications – Telecommunication Networks
EN-SPlC-702-7</td><td colspan="3">1st (Undergraduate)</td><td>4th</td><td>Fall Semester</td></tr>
<tr><th>Name / e-mail of lecturer(s)</th><th colspan="2">Weekly Hours</th><th>ECTS</th><th>module type (comp., opt.)</th><th>mode of delivery (face to face, distance learning)</th></tr>
<tr><td rowspan="2">Prof. Stylianos Savaidis
(ssavaid@teipir.gr)</td><th>Lect.</th><th>Lab.</th><th></th><th></th><th></th></tr>
<tr><td>4</td><td>2</td><td>7</td><td>compulsory</td><td>face to face</td></tr>
<tr><td>module web Page</td><td colspan="5">http://electronicstaff.teipir.gr/savaidis/index.php/en/teaching/undergraduate-courses/mobile-communications-telecommunication-networks-/lectures.html</td></tr>
<tr><td>learning outcomes</td><td colspan="5">Upon successful completion of this course module, students are expected to:

1. Describe the network architecture and the key protocols involved in the major mobile communication networks: GSM-GPRS-3G WCDMA-4G LTE, 802.11 WLAN networks.
2. Describe and Explain the key network design and Operation-Maintenance principles of GSM-GPRS-3G WCDMA-4G LTE, 802.11 WLAN networks.
3. Analyze basic network design & Operation-Maintenance issues that apply in GSM-GPRS-3G WCDMA-4G LTE, 802.11 WLAN networks.
4. Develop solutions for basic design and Operation – Maintenance study cases that may apply in GSM-GPRS-3G WCDMA-4G LTE, 802.11 WLAN networks.
5. Describe the network architecture and the key protocols involved in the PSTN/ISDN Telephony networks.
6. Describe and Explain the key network design and Operation-Maintenance principles of PSTN/ISDN Telephony networks.
7. Analyze basic network design & Operation-Maintenance issues that apply in PSTN/ISDN Telephony networks..
8. Develop solutions for basic design and Operation – Maintenance study cases that may apply in PSTN/ISDN Telephony networks.
9. Describe the network architecture and the key protocols involved in the LAN/WAN networks.
10. Describe and Explain the key network design and Operation-Maintenance principles of LAN / WAN networks.
11. Analyze basic network design & Operation-Maintenance issues that apply in LAN / WAN networks..
12. Develop solutions for basic design and Operation – Maintenance study cases that may apply in LAN /WAN networks.
13. Describe and explain the network and protocol architecture of VoIP networks.</td></tr>
<tr><td>prerequisites and co-</td><td colspan="5">N/A</td></tr>
</table>

requisites:	
recommended optional programme components	N/A
module description	*Theory* Mobile Communications Section includes: a) Overview of mobile radio channel characteristics, b) Cellular coverage principles c) Multiple Access Techniques d) GSM-GPRS-3G WCDMA Network & Protocol Architecture e) WLAN Network & Protocol Architecture f) Wireless Network trends (LTE, WMAN, WPAN). Telecommunication Networks Section includes: a) a)Telecommunication Network Principles & Terms, b) b)Digital Telephony Networks, c) LAN/MAN/WAN Data Networks d) VoIP Networks *Laboratory* 1. Digital Telephony: PBX Operation & Maintenance. 2. Trunk Signalling: SS7-ISUP 3. GSM Air Interface Physical Layer Measurements 4. GSM Air Interface Layer 3 (CM, MM, RRM) Signaling Sequences and Messages 5. LAN / WAN HW Infrastructure - Operation & Maintenance Tasks (Routers / Switches) 6. WLAN HW Infrastructure - Operation & Maintenance Tasks
recommended or required bibliography:	Essential Reading 1. STALLINGS, W.(2005), *Wireless Communications and Networks,* Pearson Education International. 2. STALLINGS, W.(2000), *Data Computer Communications,* Prentice Hall. 3. FREEMAN, R.L. (2005), *Fundamentals of Telecommunication,* John Wiley & Sons. Recommended Reading 1. BERTONI, H.L. (2000), *Radio Propagation for Modern Wireless Systems,* Prentice Hall. 2. LEE, W.C.(1998), *Mobile Communications Engineering,* McGraw-Hill,. 3. LEE, W.C. (1995), *Mobile Cellular Telecommunications,* McGraw-Hill. 4. RAPPAPORT, T. , *Wireless Communications,* Prentice Hall. 5. SAUNDERS, S. R. (1999), Antennas and Propagation for Wireless Communication Systems, John Wiley & Sons. 6. SCHILLER, J. (2003), *Mobile Communications*, Addison Wesley.
planned learning activities and	Face to face lectures Laboratory Experiments

<table>
<tr><td>teaching methods:</td><td>
<table>
<tr><th>Learning Activity</th><th>Load (hours)</th></tr>
<tr><td>Lectures</td><td>104</td></tr>
<tr><td>Lab Experiments</td><td>26</td></tr>
<tr><td>Group work – reports on lab experiments</td><td>26</td></tr>
<tr><td>Self study and reading of papers</td><td>54</td></tr>
<tr><td>Σύνολο Μαθήματος</td><td>210</td></tr>
</table>
</td></tr>
<tr><td>assessment methods and criteria:</td><td>Final exam (60%)
Laboratory Exams & Projects (40%)</td></tr>
<tr><td>language of instruction:</td><td>Greek and English</td></tr>
</table>