**Course Syllabus**

Academic year: 2020-2021

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| Institution | University of Petroşani |
| Faculty | Mechanical and Electrical Engineering |
| Field of study | Computers Engineering |
| Level | Master |
| Program of study | Applied Computer Techniques and Technologies |

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| Course | **Modern communication technologies in computer networks** |
| Code | 2TTIA1OS07 |
| Year of study (semester) | I (II) |
| Number of hours | 70 |
| Number of credits | 6 |
| Professor | Lecturer, Ph.D. Riurean Simona |

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| **No.** | **Topic** |
| 1 | Overviw of computer networks models OSI and TCP / IP. IEEE standards for wired and wireless networks. |
| 2 | Transmission media. Wired and wireless environments. Electromagnetic spectrum. Radio transmission. Microwave transmission. Infrared waves. |
| 3 | Wireless technologies in networks. RF based technologies (Bluetooth, BLE, ZigBee, GSM, LoRa, 6LoPAN) |
| 4 | Technologies based on optical spectrum (VLC, OCC, FSO, IrDA Interface, LiFi). |
| 5 | VLC wireless communication. oTx and oRx. Types. Performance. LoS positioning architectures, nLos. Mathematical calculation models CIR and RMS-SD |
| 6 | Signal modulation techniques Analog modulation. Discreet. In phase, frequency, amplitude. PWM, M-PPM, M-PAM, FSK, ASK, OFDM, ACO-OFDM, DC-OFDM, CAP. |
| 7 | OSI security architecture. Security threats. OSI security services and mechanisms. Cryptography. Symmetric key algorithms. Algorithms with public keys. Digital signature. VLAN virtual local area networks. Technical means for security. Authentication protocols. E-mail security. Web security. SSL protocol. Firewall system. Security standard 802.10. |