

<b>Subject code:</b> M.1(1)	<b>Subject name:</b> Mobile Networks		
<b>Study load:</b> 3 ECTS	<b>Load of contact hours:</b> 60	<b>Study semester:</b> Autumn	<b>Assessment:</b> 5-point grade credit
<b>Objectives:</b>	The goal of this course is to create an understanding of mobile networks and skills to implement, configure and troubleshoot network services and applications in mobile networks ecosystem		
<b>Course outline:</b>	<p>Topics covered:</p> <ol style="list-style-type: none"> <li>1. Basic definitions. Network taxonomies.</li> <li>2. Internet organization and network applications.</li> <li>3. OSI/ISO, TCP/IP multilayered models.</li> <li>4. Wireless and cellular communications: networks architecture evolution: GSM, GPRS, EDGE, CDMA, WCDMA, UMTS.</li> <li>5. 3GPP and LTE network architecture and emerging technologies. Aggregations.</li> <li>6. Internetworks and IPv4 protocol. Infrastructure services.</li> <li>7. IPv6 and infrastructure services.</li> <li>8. Mobile network applications peculiar properties. Multimedia and QoS. VoIP protocols. IoT.</li> <li>9. Developing network applications in Android.</li> <li>10. Performance measurements and troubleshooting network applications.</li> </ol> <p>Contact lessons will be divided into two parts: lectures and labs</p>		
<b>Learning Outcomes:</b>	<p>The following knowledge, skills, and attitudes are to be achieved by the end of the course:</p> <ol style="list-style-type: none"> <li>1. Understanding basic terminology, taxonomies, main technologies; critically analyse tendencies in mobile networking: in terms of communications technologies, network services and corresponding businesses.</li> <li>2. Be able to implement, configure and troubleshoot IPv4 and IPv6 implementations in mobile networks and operating systems, network services in mobile networks ecosystem.</li> </ol>		
<b>Assessment Methods:</b>	Assessment is split into two parts: tests, individual tasks, including 1 mandatory presentation.		
<b>Teacher(s):</b>	Andrey Koval		
<b>Prerequisite subject(s):</b>	None		

<b>Compulsory Literature:</b>	James F Kurose, Keith W Ross.. Computer Networking: A Top-Down Approach. 7-ed, Pearson Education, 2017, 864p.								
<b>Replacement Literature:</b>	Tanenbaum, Wetherall, Computer Networks, 5-ed, Pearson, 2010, 960p. Tripathi, Reed Cellular Communications: A Comprehensive and Practical Guide (IEEE Series on Digital & Mobile Communication), Wiley-IEEE Press; 1-ed, 2014, 1032p								
<b>Participation requirements:</b>	Lower limit of lectures attendance is 80%, each assessment and individual presentation must be presented by the end of the course.								
<b>Independent work:</b>	<ol style="list-style-type: none"> <li>1. “IP map”(path-map to given destination): assessment task.</li> <li>2. IPv4 infrastructure: assessment task in simulator (critical analysis of an existing topology and troubleshooting).</li> <li>3. IPv6 infrastructure: assessment task in simulator (critical analysis of an existing topology and troubleshooting).</li> <li>4. WLAN AAA infrastructure: assessment task in simulator (critical analysis of an existing topology and troubleshooting).</li> <li>5. WiFi/Cellular network diagnostic application for Android OS (incl. critical analysis of a similar existing applications)</li> <li>6. Simple network application for Android OS.</li> <li>7. Individual presentation on given topic.</li> </ol>								
<b>Grading criteria scale or the minimal level necessary for passing the subject:</b>	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Failed</td> <td>&lt; 50 points</td> </tr> <tr> <td>Passed, grade 3</td> <td>50-69 points</td> </tr> <tr> <td>Passed, grade 4</td> <td>70-89 points</td> </tr> <tr> <td>Passed, grade 5</td> <td>90-100 points</td> </tr> </table> <p><b>Points distribution:</b></p> <p>Test on lectures: 25 points  Individual Tasks: 10 points  Presentation: 15 points</p>	Failed	< 50 points	Passed, grade 3	50-69 points	Passed, grade 4	70-89 points	Passed, grade 5	90-100 points
Failed	< 50 points								
Passed, grade 3	50-69 points								
Passed, grade 4	70-89 points								
Passed, grade 5	90-100 points								
<b>Information about the course:</b>	Room ____, on ____ at ____								
<b>Date 1</b>	<b>Lecture 1</b> Classroom presentation: Basic definitions. Network taxonomies. Lab:								
<b>Date 2</b>	<b>Lecture 2</b> Classroom presentation: Internet organization and network applications. Lab: “IP map”(path-map to given destination): demo-lab task.								
<b>Date 3</b>	<b>Lecture 3</b> Classroom presentation: OSI/ISO, TCP/IP multilayered models. Lab: “IP map”(path-map to given destination): assessment (peer-review).								

<b>Date 4</b>	<p><b>Lecture 4</b>  Classroom presentation: Wireless and cellular communications: 2-5G: network networks architecture evolution: GSM, GPRS, EDGE, CDMA, WCDMA, UMTS.  Lab: WLAN AAA infrastructure: demo-lab in simulator.</p>
<b>Date 5</b>	<p><b>Lecture 5</b>  Classroom presentation: 3GPP and LTE network architecture and emerging technologies.  Lab: WLAN AAA infrastructure: assessment task in simulator.</p>
<b>Date 6</b>	<p><b>Lecture 6</b>  Classroom presentation: Internetworks and IPv4 protocol. Infrastructure services.  Lab: IPv4 infrastructure: assessment task in simulator.</p>
<b>Date 7</b>	<p><b>Lecture 7</b>  Classroom presentation: IPv6 and infrastructure services.  Lab: IPv6 infrastructure: demo-lab in simulator.</p>
<b>Date 8</b>	<p><b>Lecture 8</b>  Classroom presentation: QoS in mobile networks. Multimedia. VoIP protocols.  Lab: IPv6 infrastructure: assessment task in simulator.</p>
<b>Date 9</b>	<p><b>Lecture 9</b>  Classroom presentation: Developing network applications in Android.  Lab: Simple network application for Android OS.</p>
<b>Date 10</b>	<p><b>Lecture 10</b>  Classroom presentation: Performance measurements and troubleshooting network applications.  Lab: WiFi/Cellular network diagnostic application for Android OS.</p>