



RTU Course "Telecommunications Software"

13104 Telekomunikāciju tīklu katedra

General data

Code	RAE411
Course title	Telecommunications Software
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Post-graduate Studies
Course type	Professional
Field of study	Electronics and Telecommunications
Responsible instructor	Ansis Kavacis
Academic staff	Jans Jeļinskis
Volume of the course: parts and credits points	1 part, 4.0 Credit Points, 6.0 ECTS credits
Language of instruction	LV, EN, RU
Possibility of distance learning	Not planned
Abstract	<p>Today, a telecommunications specialist must also be a programmer! It goes without saying, that the specialized programs will be written by well-trained professional programmers, and telecommunications specialists should be able to impose reasonable and feasible action, to realize program potential and needs, to imagine the objectives to be achieved, and their efficiency. It is important to predict errors and trends so the program, taking into account the time spent to develop it, does not become "morally outdated" even before the real action begins, because such situations are common these days.</p> <p>Since in the field of the telecommunications today more and more software is built on the Java platform-independent language base, the telecom professionals need to know the Java language basics - that is the nature of technology, its application areas, language syntax, the key programmatic solutions, and the main technical solutions to hardware. The course covers the diverse range of networking tasks, which include a server-client applications, and traffic reading/generation operations with Java technology, as well as J2ME technology solutions, which allow you to create interactive applications for mobile devices.</p> <p>The given course provides students with the skills necessary to build Java SE applications and applets as well as Java ME MIDlets.</p>
Goals and objectives of the course in terms of competences and skills	<p>The goal of the course is to ensure that the learning outcomes are achieved.</p> <p>The objectives:</p> <ol style="list-style-type: none"> 1. to acquire the knowledge of the basic concepts of Java technology - OOP, independency of platform, automatic memory release, JVM; 2. to acquire skills to create, compile and run a simple Java console and GUI applications, applets and J2ME MIDlets; 3. to acquire skills to create, compile and run simple and complex Java networking applications; 4. to acquire skills to use the Java API, as well as external class libraries independently; 5. to acquire skills to build server-client application, to work with socket operations, to read packets from network interfaces, and to provide tra
Structure and tasks of independent studies	<p>A diverse range of course materials are offered for students for the independent work - all the lecture presentations, lecture abstracts, as well as practical task descriptions and examples of solutions in addition to the tasks. For each course topic the list of online materials and self-assessment tests are available for students.</p> <p>There is the feedback provided through online forums at the course site, e-mail correspondence and on-site consultations. All of the materials mentioned above are available in ORTUS environment.</p>
Recommended literature	<ol style="list-style-type: none"> 1. Lekciju konspekts – ietver visas kursa apskatītas tēmas ar praktisku uzdevumu piemēriem un detalizētu risinājumu skaidrojumu. 2. Laboratorijas darbu apraksti – daudzveidīgi kursa tēmu ietvaros veidoti praktiski uzdevumi ar risinājuma piemēriem un papildus uzdevumiem. 3. Java API (Application Programming Interface) – nemitīgi papildināts un atjaunināts Java klašu un metožu apraksts – tiek piedāvāts jaunākajā pieejamā versijā, gan lejujuplādēšanai, gan kā tiešsaistes resurss. 4. Papildus tiešsaistē pieejamo resursu saraksts – tiek nemitīgi atjaunots un papildināts.
Course prerequisites	<p>The course is desirable for those students who have a preliminary knowledge of the C++ and HTML, but that knowledge is not obligatory required. The above-mentioned background knowledge can make this course significantly easier to master.</p>

Course outline

Theme	Hours
Introduction to Java Technology	4
Java Syntax	6
Java Classes and Objects	12
Java Arrays, Conditions and Loops	10
Java Graphical Interface	6

Java for the Networking Tasks	14
Java Applet Basics	6
Java 2 Mobile Edition Basics	6

Learning outcomes and assessment

Learning outcomes	Assessment methods
<p>Students will:</p> <ul style="list-style-type: none"> • know the history of Java technology, what is independence of platform and object-oriented programming • will be able to install Java software development environment JDK • will be able to configure Windows and Linux to work with the JDK, to compile and run Java applications 	<ul style="list-style-type: none"> - Examination questions. - Self-assessment tests - Theoretical test on the topic "Introduction to Java Technology" - Homework - JDK installation and sample Java application compiling and running (if any problems, they are discussed in the online forum in ORTUS)
<ul style="list-style-type: none"> • know what is Java instructions and expressions and what data types Java uses • know the Java language syntax • know how memory release technology is organized, how to create new classes and how to access the class fields 	<ul style="list-style-type: none"> - Self-assessment test - Theoretical test on the topic of "Java syntax" - The defence of laboratory work - Examination questions and practical exercises.
<ul style="list-style-type: none"> • know what is class behaviour and attributes, object-oriented programming, principles of inheritance, interfaces • will be able to create a new class and give it the attributes and behaviours • know what is class behaviour and attributes, object-oriented programming, principles of inheritance, 	<ul style="list-style-type: none"> - Self-assessment test - Theoretical test on the topic "Java Classes and Objects" - The defence of laboratory work - Examination questions and practical exercises.
<ul style="list-style-type: none"> • know how Java Arrays are declared, initiated and modified • will be able to use arrays, conditional operators and loops • will be able to make data record into the file and read data from file • be able to create methods that contain complex behaviour scenarios and combine them independen 	<ul style="list-style-type: none"> - Self-assessment test - Theoretical test on the topic of "Java arrays, conditions and loops " - The defence of laboratory work - Examination questions and practical exercises.
<ul style="list-style-type: none"> • know how to create a Java graphical user interface (GUI) with containers and layout managers • be able to make programs with GUI components and interactivity. • be able to create Java GUI applications, which provide interactivity by using interfaces 	<ul style="list-style-type: none"> - Self-assessment test - Theoretical test on the topic of "Java graphical interface" - The defence of laboratory work - Examination questions and practical exercises.
<ul style="list-style-type: none"> • know Java API networking tool options • will be able to use external libraries for networking solutions • be able to implement socket connections • be able to implement a server-client applications • be able to implement the traffic sniffers and generators 	<ul style="list-style-type: none"> - Self-assessment test - The defence of laboratory work - Term paper - practical networking tasks, example-based – choice of network application development. - Examination questions and practical exercises
<ul style="list-style-type: none"> • know Java applet technology development stages • will be able to compile and run Java applets • will be able to create simple applets for network programming with interactive elements • be able to create Java applets and provide their output through the HTML documents 	<ul style="list-style-type: none"> - Self-assessment test - Theoretical test on the topic "Java applets Basics" - The defence of laboratory work - Examination questions and practical exercises.
<ul style="list-style-type: none"> • will know the potentialities and constraints of J2ME technology • will be able to write and run MIDlets on a simulator and a real mobile phone • will know the content of JAD and JAR files • be able to create J2ME applications with interactivity and run them on a real mobile phone 	<ul style="list-style-type: none"> - Self-assessment test - Theoretical test on the topic "Java 2ME basics" - The defence of laboratory work - Examination questions and practical exercises.

Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	4.0	6.0	3.0	0.0	1.0		*	