

SYLLABUS

Discipline name	Software Engineering
Profile	Electronics and Telecommunications Engineering
Specialization	Telecommunications Technologies and Systems
Code	51323709
Course leader	Professor Mircea VAIDA, Ph.D. – mircea.vaida@com.utcluj.ro
Collaborators	Assistant Professor Cosmin Striletschi, Ph.D., cosmin.striletschi@com.utcluj.ro
Department	Communications
Faculty	Electronics, Telecommunications and Information Technology

Sem.	Type of discipline	Course	Applications			Course	Applications			Ind. study	TOTAL	Credits	Form of assessment
		[hours/week]				[hours/semester]							
			S	L	P		S	L	P				
5	Engineering	2	-	2	-	28	-	28	-	94	150	5	V

Acquired competences :

To program Java applications. To develop Java graphical and I/O applications. Java multithreading. Distributed Java programming using sockets (stream, UDP). URL programming. RMI programming. To use UML diagrams in software applications. Basic concepts regarding the Java template mechanism.

Acquired skills (what the student is able to do):

After studying this discipline, the students will be able to:

- Write Java applications that:
- Implement basic algorithms;
- Are developed by comparison with C/C++ applications;
- Write Java applications that:
- Implement and use GUI;
- Use multithreading processes;
- Use I/O from and to files
- Allow distributed facilities
- Use the RMI communication process

Acquired abilities (what type of equipment/ instruments/ software the student is able to handle):

After studying this discipline, the students will be able to:

- Use the main facilities offered by a Java IDE;
- Develop and debug various Java applications

Prerequisites (if necessary):

Basic knowledge from:

- Computer programming course
- Algorithms and programming techniques course

A. Course/Lecture (course/lecture titles)

1	Basic concepts regarding the Object Oriented Programming. Introduction in Java
2	Comparison between Java and C/C++ applications. Basic Java concepts
3	Basic UML elements
4	GUI programming in Java. Java applets
5	Java events, the evolution of the events handling mechanisms. The description of the main elements included in the AWT and Swing packets
6	Other elements concerning the AWT and Swing graphics. Input and Output in Java
7	File handling in Java. Serialization, de-serialization. The Socket (stream) programming in Java
8	Network programming in Java using the client-server model. The socket programming. URL programming.
9	Basic concepts about the Java multithreading. Multithreading in Java
10	Mutual exclusion, synchronization in Java. JDBC elements.
11	Remote Method Invocation in Java. CORBA and DCOM
12	Basic elements regarding the template programming in Java.
13	The main collection classes used in Java.
14	Other Java technologies.

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B. Applications – Laboratory (list of laboratories), Seminar (contents), Project (project contents)	
1	C++ recapitulative applications
2	The Eclipse (NetBeans) environment. Stand alone Java applications. Strings and arrays in Java.
3	Inheritance in Java. Java interfaces.
4	User defined packets. Exceptions in Java
5	Applets and graphical Java applications.
6	Events and AWT graphics in Java.
7	Swing graphics in Java.
8	I/O and file applications in Java
9	Java distributed applications using stream sockets and datagram sockets
10	URL distributed applications
11	Multithreading in Java. Animation in Java
12	RMI Java applications
13	Laboratory evaluation. Template programming in Java
14	Final practical test

C. Individual study (reference study contents, synthesis materials, projects, applications etc.)						
10 sets of problems (the preparation part in every laboratory)						
Individual study structure	Course study	Problem solving, laboratory, project	Applications preparation	Examination time	Additional reference study	Total no. of individual study hours
Hours	28	20	5	3	18	74

References (Textbooks, courses, laboratory manual, exercise book)
<p>In UTC-N library</p> <ol style="list-style-type: none"> Mircea-Florin Vaida, si colab., Java 2 Enterprise Edition (J2EE). Aplicatii multimedia, Editura Albastra Cluj-Napoca, 2002 Mircea-Florin Vaida, Petre G. Pop, Cosmin Striletschi, Ligia Chiorean, Calin G. Login, Tehnologii avansate privind dezvoltarea aplicatiilor software in limbajul C/C++, C# si Java, Casa Cartii de Stiinta, 2006 <p>Additional materials</p> <ul style="list-style-type: none"> - course notes - laboratory materials available on the website http://mercur.utcluj.ro/lab <p>In other libraries</p> <ol style="list-style-type: none"> Stefan Tanasa, si colab., Java de la 0 la expert, Editura Polirom, 2003, 2007 Vaida M.F., Pop G.P., Striletschi C., Chiorean Ligia, - Aplicatii în limbajele C/C++ și Java, Casa Cartii de Stiinta, Cluj-Napoca, 2004

Final evaluation	
Evaluation method	Final exam will be composed by a theoretical test T (1 hour) and solving a problem on a computer P (1 hour). The laboratory will also be evaluated
Mark components	Laboratory (mark L); Theory (mark T); Problem (mark P);
Mark computation	$N = (L+T+P)/3$; is calculated only if: $T > 4$ și $P > 4$.

Course leader,

Professor Mircea-F. VAIDA, Ph.D.
