Universitatea Naţională de Ştiinţă şi Tehnologie Politehnica Bucureşti
Facultatea de Electronică, Telecomunicaţii şi
Tehnologia Informaţiei

COURSE DESCRIPTION

1. Program identification information

1.1 Higher education institution	**National University of Science and Technology Politehnica Bucharest**
1.2 Faculty	**Electronics, Telecommunications and Information Technology**
1.3 Department	**Telecommunications**
1.4 Domain of studies	Electronic Engineering, Telecommunications and Information Technology
1.5 Cycle of studies	Masters
1.6 Programme of studies	Mobile Communications

2. Date despre disciplină

2.1 Course name (ro) (en)				Proiectare in Java si Android			
2.2 Course Lecturer				Conf. Dr. Cristian-Lucian Stanciu			
2.3 Instructor for practical activities				Conf. Dr. Cristian-Lucian Stanciu			
2.4 Year of studies	1	2.5 Semester	2	2.6. Evaluation type	E	2.7 Course regime	Ob
2.8 Course type		S	2.9 Course code	1		2.10 Tipul de notare	Nota

3. Total estimated time (hours per semester for academic activities)

3.1 Number of hours per week	2	Out of which: 3.2 course	1	3.3 seminary/laboratory	1
3.4 Total hours in the curricula	28	Out of which: 3.5 course	14	3.6 seminary/laboratory	14
Distribution of time:					hours
Study according to the manual, course support, bibliography and hand notes Supplemental documentation (library, electronic access resources, in the field, etc) Preparation for practical activities, homework, essays, portfolios, etc.					40
Tutoring					0
Examinations					4
Other activities (if any):					3

3.7 Total hours of individual study	47.00
3.8 Total hours per semester	75
3.9 Number of ECTS credit points	3

4. Prerequisites (if applicable) (where applicable)

4.1 Curriculum	Object Oriented Programming
4.2 Results of learning	Basic knowledge of the C++ language (or equivalent)

5. Necessary conditions for the optimal development of teaching activities (where applicable)

5.1 Course	Not the case

5.2 Seminary/ Laboratory/Project .	Mandatory presence in laboratory (accordingly with the university internal rules)

6. General objective *(Reffering to the teachers' intentions for students and to what the students will be thought during the course. It offers an idea on the position of course in the scientific domain, as well as the role it has for the study programme. The course topics, the justification of including the course in the currcula of the study programme, etc. will be described in a general manner)*

Professional competences:

C1. Using the fundamental knowledge of Object Oriented Programming with the Java 8/11 language, and popular associated libraries and tools.

C2. Creation and running of software applications.

C3. Applying knowledge, concepts and methods of the architecture and functioning of software projects (Windows şi Android).

Transversal competences: The methodical analysis of the usual issues, identifying the problems for which well-known solutions are already available, thus accomplishing the professional tasks.

7. Competences *(Proven capacity to use knowledge, aptitudes and personal, social and/or methodological abilities in work or study situations and for personal and proffesional growth. They refflect the empolyers requirements.)*

Specific Competences	Presenting specific methodologies for the creation of applications and services using the Java 8/11/17 language. Presentation of frameworks and development environments used in production environments.
Transversal (General) Competences	Highlighting Java language and associated frameworks/libraries, such as Spring, Hibernate, Swing, etc. The presentation of the Intellij/Android Studio IDEs and project management using Apache Maven - focus on Windows and Android.

8. Learning outcomes *(Synthetic descriptions for what a student will be capable of doing or showing at the completion of a course. The learning outcomes reflect the student's acomplishments and to a lesser extent the teachers' intentions. The learning outcomes inform the students of what is expected from them with respect to performance and to obtain the desired grades and ECTS points. They are defined in concise terms, using verbs similar to the examples below and indicate what will be required for evaluation. The learning outcomes will be formulated so that the correlation with the competences defined in section 7 is highlighted.)*

Knowledge	*The result of knowledge aquisition through learning. The knowledge represents the totality of facts, priciples, theories and practices for a given work or study field. They can be theoretical and/or factual.* **Describes/classifies elements of OOP (classes, instances, interfaces, etc.) specific for the Java language**. **Hands-on experience with Java 8/11/17 frameworks, libraries and tools, respectively with Android Studio.**
Skills	*The capacity to apply the knowledge and use the know-how for completing tasks and solving problems. The skills are described as being cognitive (requiring the use of logical, intuitive and creative thinking) or practical (implying manual dexterity and the use of methods, materials, tools and intrumentation).* Create, run, debug Java software applications.

Responsability and autonomy	*The student's capacity to autonomously and responsably apply their knowledge and skills.* Create and manage Java software applications by programming within presented frameworks/libraries. Gain autonomy in future study and development with new versions of the presented frameworks/libraries.

9. Teaching techniques *(Student centric techniques will be considered. The means for students to participate in defining their own study path, the identification of eventual fallbacks and the remedial measures that will be adopted in those cases will be described.)*

Lecture teaching is based on using the projector (covering communication function and demonstration).

Employed oral communication methods are the expository method and the problem-method.
Laboratory teaching is based on oral communication and projector/screen sharing.

Course materials are lecture notes and presentations, exercise book proposed (theoretical and solving computer).

All materials are available electronically through the course website.

10. Contents

COURSE		
Chapter	**Content**	**No. hours**
1	Introduction to Java SE for advanced software technologies 1.1. Object Oriented Programming in Java, JVM, data types, operators, Intellij IDE, debugging. 1.2. Decisional and repetitive instructions, arrays, operations with arrays 1.3 Classes and objects, attributes and methods, encapsulation, getters and setters 1.4 Predefined classes, Enumerations, packages, resource types (.jar, .war).	2
2	Advanced Java features and classes 2.1. Date and time classes, Locale class, formatting and patterns (Java 1.8/11) 2.2. Inheritance 2.3. Exceptions 2.4 Graphical interfaces (Swing) and file management 2.5 Collections, parameters and generics 2.6 Multithreading	7,5
3	Java frameworks and database connectivity 3.1. Architectures based on MVC model (Spring) 3.2. Solutions for advanced persistence support (JDBC, JPA, Hibernate)	2,5
4	Advanced software on Android Studio 4.1. Java programming on Android Studio platform 4.2. Web services access on Android Studio platform	2
	Total:	14

Bibliography:
- OCA Java SE 8, Programmer Exam Guide, Kathy Sierra, Bert Bates, Oracle, 2017 by McGraw-Hill Education.
- Java SE, http://www.oracle.com/technetwork/java/javase/overview/index.html.
- Android Studio, https://developer.android.com/studio
- Spring framework, https://spring.io/.
- Hibernate ORM, http://hibernate.org/.
- Apache Maven Project, https://maven.apache.org/.

LABORATORY

Crt. no.	Content	No. hours
1	Basic usage of Java classes – Eclipse IDE, Maven. Advanced Java classes.	3
2	Java frameworks – Spring.	4
3	Java ORM – Hibernate/Spring Data JPA.	4
4	Programming in Android Studio.	2
5	Verification laboratory	2
	Total:	

Bibliography:
- OCA Java SE 8, Programmer Exam Guide, Kathy Sierra, Bert Bates, Oracle, 2017 by McGraw-Hill Education.
- Java SE, http://www.oracle.com/technetwork/java/javase/overview/index.html.
- Android Studio, https://developer.android.com/studio
- Spring framework, https://spring.io/.
- Hibernate ORM, http://hibernate.org/.
- Apache Maven Project, https://maven.apache.org/.

11. Evaluation

Activity type	11.1 Evaluation criteria	11.2 Evaluation methods	11.3 Percentage of final grade
11.4 Course	Software project	Oral presentation/practical demonstration	50%
11.5 Seminary/laboratory/project	Technical questions based on software project	Oral examination	50%
11.6 Passing conditions			
Obtaining 50 points or more.			

12. Corroborate the content of the course with the expectations of representatives of employers and representative professional associations in the field of the program, as well as with the current state of knowledge in the scientific field approached and practices in higher education institutions in the European Higher Education Area (EHEA)

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The industry has a demand for qualified engineers with specializations related to object oriented programming applied for software applications working with relational databases, in order to maintain the development rate of new products/software applications for desktop and mobile systems. The course curriculum responds in a concrete way to the current evolving requirements of the European Internet service economy. In the context of the current technological progress of computing systems, devices that have access to web services are constantly growing in number.

This provides graduates with the appropriate competences and training needs of current modern scientific and technical quality and competitive skills, enabling rapid employment after graduation. This is perfectly framed in the policy of Politehnica University of Bucharest, both in terms of content and structure and in terms of skills and international openness for students.

Date	Course lecturer	Instructor(s) for practical activities
25.09.2025	Conf. Dr. Cristian-Lucian Stanciu	Conf. Dr. Cristian-Lucian Stanciu

Date of department approval	Head of department
26.09.2025	Conf. Dr. Serban Georgica Obreja

Date of approval in the Faculty Council	Dean
26.09.2025	Prof. Dr. Mihnea Udrea