



## Main information on the course

Course name	<b>Usable Privacy and Security</b>	
Degree	Computer Science (second-level degree in Computer Science)	
Academic year	2023-2024	
European Credit Transfer and Accumulation System (ECTS), in Italian Crediti Formativi Universitari (CFU)	9 CFU (each CFU corresponds to 25 hours (h) of student's time); CFU are of type T1, T2 or T3 T1 = 8 h lecture + 17 h individual study T2 = 15 h practice + 10 h individual study T3 = 25 h individual study	
Settore Scientifico Disciplinare	INF/01	
Course language	English	
Course year in the curriculum	First	
Course period	Second Semester, from March 1 <sup>st</sup> 2024 to June 7 <sup>th</sup> 2024	
Course attendance requirement	It is highly recommended to attend classes	
Website of Computer Science curriculum	<a href="https://www.uniba.it/it/ricerca/dipartimenti/informatica/didattica/corsi-di-laurea/computer-science/computer-science">https://www.uniba.it/it/ricerca/dipartimenti/informatica/didattica/corsi-di-laurea/computer-science/computer-science</a>	

<b>Teacher(s)</b>	
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e-learning platform	available at <a href="https://elearning.uniba.it/">https://elearning.uniba.it/</a>
Teacher's homepage	<a href="http://ivu.di.uniba.it/people/costabile.htm">http://ivu.di.uniba.it/people/costabile.htm</a>
Office hours	Office hours are: Wednesday 9:30-11:30 during June-February; Monday 9:30-11:00 during March, April and May. Students may send an email to the teacher to require an appointment out of the above indicated times



Syllabus	
<b>Course goals</b>	<p>It is increasingly acknowledged that technology alone will not provide all solutions to security and privacy problems. Human factors play an essential role in these areas, and it is important for security and privacy experts to have an understanding of how people will interact with the systems they develop. This course is designed to introduce students to a variety of usability and user-interface problems related to privacy and security and to give them experience in understanding and designing studies aimed at helping to evaluate usability issues in security and privacy systems. The course goals are:</p> <ul style="list-style-type: none"><li>To appreciate the importance of usability within security and privacy;</li><li>To learn about current research in usable privacy and security;</li><li>To learn how to conduct usability studies;</li><li>To learn how to critically examine UPS studies.</li></ul>
<b>Prerequisites/requirements</b>	<p>There are not mandatory prerequisites/requirements, but it is better if students know basic elements of Human-Computer Interaction (HCI)</p>
<b>Course program</b>	<ul style="list-style-type: none"><li>- Basic concepts of HCI: Interaction design, Usability and User eXperience (UX), Human-centred design (brief recall from a previous course of a first level degree in Computer Science at the University of Bari)</li><li>- Human in the Loop in secure systems</li><li>- Usable security – Definition and brief and history</li><li>- Usable security: user authentication, graphical authentication, phishing, policy authentication</li><li>- Usable privacy design strategies</li><li>- Security warnings</li><li>- Data gathering techniques: interviews, surveys, focus groups, observation</li><li>- Quantitative and qualitative dates. Analysis of qualitative data; Analysis of quantitative data. Inferential statistics</li><li>- Evaluation studies. Usability testing. Field studies, Lab studies and Controlled experiments, Online studies.</li><li>- Visualizations for Security</li></ul> <p><b>Practice session</b> Exercise and discussions on: Design and evaluation of prototypes and/or interactive systems, user studies; Analysis of qualitative and quantitative data in user studies.</p> <p>It is required to develop a case study in small groups and to present it in class.</p>
<b>Books of reference</b>	<ol style="list-style-type: none"><li>1. Simson Garfinkel, Heather Richter Lipford, "Usable Security – History, Themes and Challenges", Morgan &amp; Claypool, 2014.</li><li>2. Preece, J., Rogers, Y., Sharp, H. "Interaction Design, beyond human-computer interaction", John Wiley &amp; Sons, 6th Edition, 2023.</li><li>3. Lazar, J., Feng J.K., Hocheiser, H. Research methods in Human-Computer Interaction, 2005, Morgan Kaufmann Publisher, 2nd Edition, 2017.</li></ol> <p>Scientific articles indicated by the teacher.</p>
<b>Notes to the books</b>	<p>Book n. 1 is the textbook; topics of all chapters are discussed in class and must be studied.</p> <p>Book n. 2: some chapters are discussed in class and must be studied; they will be indicated in class.</p> <p>Book n. 3: some chapters are discussed in class and must be studied; they will be indicated in class.</p>



	Students will register to access the e-learning platform used by the Computer Science courses, on which the teacher makes available some didactic material and the slides used in class. The teacher reports on this platform data and content of each class.		
<b>Organization of the didactic activities</b>			
<b>Hours</b>			
Total (in class)	Lectures (in class)	Practice sessions (in class)	Individual study + Case study (1 CFU)
78 hours (48+30)	48 hours	30 hours	122 hours + 25 hours
<b>CFU/ETCS</b>			
9 CFU	6 CFU	2 CFU	

<b>Teaching methods</b>	
	<p>Lectures in class, supported by projected slides that also show examples to better illustrate the discussed topics.</p> <p>Practice sessions, which include:</p> <ul style="list-style-type: none"> <li>- Exercise and discussions on: Design and evaluation of prototypes and/or interactive systems, user studies; Analysis of qualitative and quantitative data in user studies</li> <li>- Workshop-style sections to deepen with students the topics on usable privacy and security presented in class and to discuss projects and/or case studies presented by students.</li> </ul>

<b>Expected learning outcomes</b>	
<b>Knowledge and understanding</b>	<p>Cyberattacks are emerging as problems caused not only by technological aspects but also by human factors neglected when designing interactive systems. Thus, it is important for security and privacy experts to have an understanding of how people will interact with the systems they develop.</p> <p>The course's learning outcomes are:</p> <ol style="list-style-type: none"> <li>1) students will learn HCI principles, methodologies and techniques that consider security and privacy aspects in developing interactive systems;</li> <li>2) students will learn about advanced interaction technology for secure systems;</li> <li>3) by discussing a variety of usability and user-interface problems related to privacy and security, students will make experience to design studies aimed at evaluating usability issues about system security and privacy.</li> </ol> <p>Students acquire this knowledge through teacher's lectures and possibly specific seminars, as well as discussions and exercises through which they practice what they have learned. In this way, they also gain awareness of their understanding and learning skills and on how these skills can be improved.</p>
<b>Applying knowledge and understanding</b>	<p>In order to enable students to apply the acquired knowledge, they perform both individual and collaborative exercises. In addition, students are required to develop, mostly by collaborating in group, small projects and/or case studies in which they</p>



	<p>apply some of techniques presented in class, having selected the most appropriate ones for the specific case. These projects/case studies contribute to the final assessment of the student and thus to the final grade the student gets for the course.</p>
<b>Other skills</b>	<p><i>Making judgements</i> An important objective of the course is that the student achieves the ability to integrate knowledge, handle complexity and make decisions during the design, development and evaluation of the system software modules related to the interaction with users. Exercises, projects and case studies performed during the course, which are discussed by teacher and students, are a means to train students to make judgements. This ability is evaluated by the teacher and contributes to the final grade, which also takes into account the active participation of the student to the discussions in class and the presentation of projects/case studies.</p> <p><i>Communication</i> Students are encouraged to work in groups and are often invited to illustrate the outcome of exercises carried out individually or in groups, with the goal of developing their communication and collaboration skills. Students are also required to develop small projects/case studies in which they apply some of the learned techniques, selecting those ones that they feel most appropriate (based on their ability to make judgments). Projects/case studies are presented in class or at the oral examination; this allows the student to demonstrate his/her communicative abilities by illustrating the performed work, possibly using some slides previously prepared.</p> <p><i>Learning skills</i> In order to stimulate their own learning skills, students are solicited to deepen some topics not discussed in detail by the teacher, using the recommended books and/or other sources. Student might present in class these topics or might also discuss them during the final examination. Students are also invited to attend seminars held by other lecturers, internal to the department or visiting researchers, and they might be asked to discuss later in class the content of such seminars.</p>

Assessment	
<b>Assessment methods</b>	<p>The main assessment method is the final examination that includes: 1) a written test asking the student to answer both closed and open questions about the course program; 2) an oral exam to discuss the written test. A partial exam takes place around the middle of the course; it is similar to the written test of the final exam and it is composed of open and closed questions on the program already completed. Only students who attend about 80% of the classes can take advantage of this partial examination, in order to stimulate them to attend classes. For the students attending classes, projects/case studies are carried out during the class semester. Students who do not attend the classes must meet the teacher at the beginning of the semester so that they may tell the teacher that will not attend the classes and discuss about their projects/case study. The description of the projects/case studies students have to perform will be reported in the area dedicated to the course on the e-learning platform.</p>
<b>Evaluation criteria</b>	<p>In order to assess the knowledge acquired by student, and also the acquired abilities to make judgments and to communicate as well as their learning skills, the written test (individual) is evaluated on the basis of the correctness of the answers provided by the student and, considering the open answers, his/her ability to synthesise, the</p>



	<p>clarity of the presentation, the examples provided to better illustrate the written text, the ability to make comparisons and provide their own critical views.</p> <p>Projects and/or case studies will be evaluated by taking into account how they has been thoroughly carried out, the appropriateness of the techniques used, the originality of the solutions, the clarity and the synthesis capabilities that result from the produced documentation (written report and/or slide presentation).</p>
Measurements and final grade	<p>The final grade ranges from 18 to 30. For very good students, it could be 30 cum laude.</p> <p>The written test scores approximately 80% of the overall examination grade, while project/case studies about 15% and the remaining 5% takes into account the student's active and autonomous participation in classroom discussions, exercises and other activities performed during the course.</p>
<b>Further information</b>	<p>In order to participate to the final exam, students mut make reservation at least 7 days before the date of the written exam and of the oral exam, by using the ESSE3 system. Without reservation in ESSE3, students cannot participate to the exam.</p>