COURSE DESCRIPTION – ACADEMIC YEAR 2021/2022

Course title	**Software and Systems Security**
Course code	76060
Scientific sector	ING-INF/05
Degree	Master in Software Engineering for Information Systems (LM-18)
Semester	2
Year	1
Credits	6
Modular	No

Total lecturing hours	40
Total exercise hours	20
Attendance	Recommended especially for the labs.
Prerequisites	Students are expected to have solid mathematical foundation and be familiar with the basics of information security. These prerequisites are normally covered in any Bachelors in Computer Science.
Course page	https://ole.unibz.it/

Specific educational objectives	The course belongs to the type "caratterizzanti – discipline informatiche"-"Advanced Topic in Software /Systems Engineering". The main aim of the course is to provide in-depth knowledge of the field of system security. The course, supported by labs, aims to teach students the principles and techniques and give students the required practical experience for implementing the secure systems. At the end of the course, the students will: • Understand cryptography, its evolution, and some key encryption techniques currently used. • understand security policies and protocols for implementing such policies. • understand and incorporate approaches for securing access to the system. • understand and incorporate approaches for differentiating between malign and benign software. • understand and incorporate approaches for incident analysis and response. • understand distributed system attacks, the countermeasures, and forensics to investigate the aftermath. • understand and ensure the security of systems, protect personal data, and secure networks.

Lecturer	Attaullah Buriro
Contact	Piazza Domenicani, 3, Room 2.14, attaullah.buriro@unibz.it
Scientific sector of lecturer	ING-INF/05
Teaching language	English
Office hours	Will be set up upon email request
Lecturing Assistant (if any)	--
Contact LA	--
Office hours LA	--

List of topics	• Computer Security Technology and Principles • Data security • Software and Network Security and Trusted Systems • Social security • System Vulnerabilities and Attacks • Security Management
Teaching format	Class room lecture and lab sessions

Learning outcomes	**Knowledge and understanding:** D1.1 To have a sound knowledge of both the fundamentals and the application aspects of the various core areas of information technology; D1.4 To know in depth the principles, structures and use of computer systems for the automation of information systems; **Applying knowledge and understanding:** D2.1 To know how to apply the fundamentals of empirical analysis of ICT data to the construction of mathematical models for the evaluation and prediction of characteristics of applications and software systems; **Making judgments** D3.2 To be able to plan and re-plan a technical project activity and to carry it out in accordance with defined deadlines and objectives; **Communication skills** D4.2 To be able to present the contents of a scientific/technical report to an audience, including non-specialists, at a fixed time; D4.5 To be able to prepare and conduct technical presentations in English; **Learning skills** D5.2 To be able to keep up to date independently with developments in the most important areas of information technology.

Assessment	Written and lab: written exam with verification questions, conducting experiments and evaluating results.
Assessment language	English
Assessment typology	Monocratic commission
Evaluation criteria and criteria for awarding marks	Assessment 1: 40% points (lab activity) Assessment 2: 60% points (written exam) Assessment 1: ability to perform the experiment/project, skill in applying knowledge in a practical setting, ability to summarize in own words.

	Assessment 2: clarity of answers, ability to recall principles and methods used in system security, skill in applying knowledge such as testing the security of systems.

Required readings	Lecture material (slides, notes, scientific papers, etc.) provided by the lecturer.
Supplementary readings	William Stallings and Lawrie Brown, "Computer Security Principles and Practices", 3rd Edition, Pearson (2015) Michael E. Whitman and Herbert J. Mattord, "Principles of Information Security", 5th Edition, CENCAGE Learning CompTIA Security+ Guide to Network Security Fundamentals 6th Edition, Mark Ciampa ISBN 978-1337288781
Software used	Will be provided by the lecturer during lectures/lab sessions.