# Syllabus

## *Course Description*

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| **Course Title** | Computer Networks |
| **Course Code** | 76207 |
| **Course Title Additional** | |
| **Scientific-Disciplinary Sector** | IINF-05/A |
| **Language** | Italian |
| **Degree Course** | Bachelor in Computer Science |
| **Other Degree Courses (Loaned)** | |
| **Lecturers** | dr. Florian Hofer,<br>Florian.Hofer@unibz.it<br>https://www.unibz.it/en/faculties/engineering/academic-staff/person/37220 |
| **Teaching Assistant** | |
| **Semester** | First semester |
| **Course Year/s** | 3 |
| **CP** | 6 |
| **Teaching Hours** | 40 |
| **Lab Hours** | 20 |
| **Individual Study Hours** | 90 |
| **Planned Office Hours** | |
| **Contents Summary** | – Introduction to computer networks<br>– ISO OSI reference model<br>– Internet applications and application protocols (HTTP, SMTP, DNS)<br>– Network protocols: TCP/IP, Ethernet<br>– Sockets and RPCs<br>– Failure robustness, security |
| **Course Topics** | This course aims at providing a solid background in computer networks. Theory will be intertwined with discussions about how the notions introduced are exploited in practice, taking the Java |

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| | framework as reference. This will allow to see in real contexts why distributed systems are important. |
| **Keywords** | Internet, TCP/IP, Networks, Protocols |
| **Recommended Prerequisites** | The course requires basic knowledge of data structures and algorithms, as well as foundational Java programming skills. |
| **Propaedeutic Courses** | |
| **Teaching Format** | The course includes frontal lectures and lab exercises. |
| **Mandatory Attendance** | Not compulsory, but recommended |
| **Specific Educational Objectives and Learning Outcomes** | Knowledge and Understanding<br>– D1.11 Know in detail the principles of computer networks and distributed systems<br>– D1.12 Know in detail the internet fundamental principles and the methodologies for their design and development.<br>Applying knowledge and understanding<br>– D2.9 Be able to plan and program in distributed programming environments and in digital networks.<br>Ability to make judgments<br>– D3.1 Be able to collect and interpret useful data and to judge information systems and their applicability.<br>– D3.2 Be able to work autonomously according to the own level of knowledge and understanding.<br>Communication skills<br>– D4.1 Be able to use one of the three languages English, Italian and German, and be able to use technical terms and communication appropriately.<br>– D4.2 Be able to use modern communication systems, even at a distance.<br>Learning skills<br>– D5.1 Have developed learning capabilities to pursue further studies with a high degree of autonomy.<br>– D5.3 Be able to follow the fast technological evolution and to learn cutting edge IT technologies and innovative aspects of last generation information systems. |
| **Specific Educational Objectives and Learning Outcomes (additional info.)** | |
| **Assessment** | The assessment consists of an oral exam (D1.11, D1.12, D4.1, D5.1, D5.3) and lab reports, which contain practical excercises |

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| | (D1.11, D1.12, D2.9, D4.1, D4.2) and project work (D2.9, D3.1, D3.2, D4.2, D5.1). |
| **Evaluation Criteria** | Marks are distributed as follows: 30% for the lab reports and 70% for the oral exam. Attending the lab is not mandatory but is recommended, as it can help improve the oral exam grade.<br><br>The final grade is calculated as a weighted average of the lab reports (30%) and the oral exam (70%). However, the lab report marks are considered only if they are higher than the oral exam grade. The 30% weight for the lab reports applies only if three assignments are submitted; if fewer assignments are delivered, the weight is adjusted proportionally. |
| **Required Readings** | James Kurose and Keith Ross. Computer Networking: A Top-Down Approach. Pearson, Boston Munich, 7th edition, April 2016. ISBN 978-0-13-359414-0. |
| **Supplementary Readings** | Andrew Tanenbaum and David Wetherall. Computer Networks. Pearson, Boston, 5th edition, September 2010. ISBN 978-0-13-212695-3.<br><br>Andrew S. Tanenbaum and Maarten van Steen. Distributed Systems: Principles and Paradigms. CreateSpace Independent Publishing Platform, The Netherlands?, 2nd edition, February 2016. ISBN 978-1-5302-8175-6 |
| **Further Information** | Software used:<br>Wireshark (https://www.wireshark.org)<br>Java (https://openjdk.org)<br>*nix tools (*sh, *ssh, iproute2, dig, tracepath..) |
| **Sustainable Development Goals (SDGs)** | Decent work and economic growth, Responsible consumption and production, Industry, innovation and infrastructure |