

PROGRAMMA CORSO ITS NITP

Titolo del Corso:

Networking and Information Technology Professional for Smart Cities

In accordo con quanto previsto per i corsi ITS già operativi in Italia:

- durata di due anni, divisi in 4/6 Semestri/Quadrimestri.
- durata totale di 2.000 ore circa, ripartite annualmente in circa 620 ore di lezione (inclusa una intensa attività di laboratorio) e 380 ore di tirocinio sul lavoro.

Il corso si articola in 6 quadrimestri, nei quali si tratteranno i seguenti macroargomenti:

Anno 1:

- Elements of math (120 h)
- Networking essentials (210 h)
- Information Technology fundamentals (100 h)
- Security essentials (120 h)
- Personal and Employability skills (70 h)

Anno 2:

- Advanced Networking (210 h)
- Advanced Information Technologies (150 h)
- Data Center and Cloud Technologies (160 h)
- Business soft skills (100 h)

Di seguito, per ciascun macroargomento viene data una suddivisione in moduli e una breve descrizione di obiettivi e contenuti di ciascun modulo.

Year 1 - Elements of math:

- Principle of Applied Mathematics for Science and Engineering
 - The module provides basic principles of Mathematical tools for Science and Engineering, such as Analytical geometry, Differential Calculus (Derivatives, Integration, Elementary Differential Equations), Fourier analysis.
- Principles of Algebra and Logic
 - This module provides elementary structures in linear algebra useful in calculus and algorithm and introduces first concept about logic proposition and formalization of language used in modern math.
- Elements of Physics
 - This module aims to give knowledge of main concepts behind telecommunications through the study of their physics foundation elements.

Year 1 - Networking essentials:

- Network Communications Technologies
 - This module introduce the technologies behind fixed and mobile networks through key concepts as modulation, radio signal and traffic.
- *Network architecture*
 - This module shows the architecture, structure, functions, components, and models of the ICT networks from the first one to the ones used nowadays.
- *Routing and Switching Essentials*
 - This module describes the architecture, components, and operations of routers and switches in a small network. Practice is based on Cisco and Juniper Technologies.
- ***CERTIFICATION: Cisco Certified Network Associate Routing & Switching (CCNA RS)***

Year 1 - Information Technology fundamentals:

- *Computer Systems*
 - This module will enable to develop a sound understanding of the essential hardware and software components of a computer system, using the PC architecture exemplar.
- Introducing to computer programming
 - This module introduce fundamentals concepts used in development of computer programs through an appropriate programming language.

Year 1 - Security Essentials:

- *Network Security*
 - This module describes secure network infrastructure, core security concepts, managing of secure access, VPN encryption, firewalls, intrusion prevention, web and email content security, and endpoint security. Practice is based on Cisco and Juniper Technologies.
- *Secure Access Solutions*
 - This module is designed to provide students with foundational knowledge and the capabilities to implement and manage network access security. The student will gain hands-on experience with configuring various advance security solutions for mitigating outside threats and securing devices connecting to the network.
- *Information Systems Security Essentials*
 - This module aims to develop skills on protecting information assets by ensuring availability, confidentiality, integrity, authenticity, and non-repudiation of information systems. Practice will be on Windows/Linux/Android systems.
- ***CERTIFICATION: Cisco Certified Network Associate Security (CCNA-Security)***

Year 1 - Personal and Employability skills:

- *Technical and Practice English*
 - This module builds the language foundation needed for working and understanding the ICT world.
- *Teamwork and work ethic*
 - This module will enable you to develop an understanding of the attitude required in a real workplace working in a team or interacting with colleagues. Will also be explained the hierarchical methods behind the division of a task.

Year 2 - Advanced Networking:

- *Advanced Routing*
 - This module describes advanced IP addressing and routing protocols in implementing scalable and highly secure IP Enterprise and Carrier Networks. Practice is based on Cisco and Juniper Technologies.
- *Advanced Switching Technologies*
 - This module aims to develop skills on planning, configuring, and verifying the implementation of complex enterprise switching solutions. Practice is based on Cisco and Juniper Technologies.
- *Troubleshooting of IP Networks*
 - This module aims to develop skills on planning and performing regular maintenance on complex enterprise routed and switched networks and use technology-based practices and a systematic ITIL-compliant approach to perform network troubleshooting. Practice is based on Cisco networking devices.
- ***CERTIFICATION: Cisco Certified Network Professional Routing & Switching (CCNP RS)***

Year 2 - Advanced Information Technology:

- *Database Engineering*
 - This module will provide students the skills required to design, create and maintain a relational database, enabling them to administer a real operative system to the requirements of the industry.
- *Mobile platform*
 - This module will introduce the mobile Operating Systems and their actual role in the industry. Will be provided a views of the different platforms and an introduction of the multi-platforming developing.
- *Server Administration and Virtualization*
 - This module will provide a knowledge of the server system, from hardware to software, and how they are managed. An introduction to the virtualization technology and the most wide used hypervisor in industry will also be provided.

Year 2 - Data Center Technologies

- *Data Center Networking essentials*
 - This module aims to introduce networking concepts for the Data Center environment. Fundamental information will be given on how a Data center network works, how to configure virtualization in the network, addressing schemes, troubleshooting and configuration skills.
- *Data Center Technologies essentials*
 - This module aims to develop skills on fundamental Data Center technologies like network and server Virtualization, Storage, Convergent I/O and network services like load balancing.
- *Cloud Technologies*
 - This module aims to explain the services offered on the market by the Data Center. This will be focused on the different cloud technologies as IaaS, PaaS, SaaS and other use cases.

Year 2 - Business Soft Skills:

- *Employability based learning*
 - This module aims to improve student's capacity of accomplish employment-related tasks through the knowledge of the industry requirement, the jobs scenario and the interview preparation.
- *Planning and managing Project*
 - This module is designed to introduce the main concept behind project management. From planning a work to lead a team towards a goal. There will be examine the methodologies used in current business practice.