

Course guide

300101 - STCNEXTG - Next Generation Ieee 802.11 Standards

Last modified: 04/07/2026

Unit in charge: Castelldefels School of Telecommunications and Aerospace Engineering
Teaching unit: **Degree:** MASTER'S DEGREE IN ARTIFICIAL INTELLIGENCE FOR CONNECTED INDUSTRIES (AI4CI) (Syllabus 2025). (Optional subject).

Academic year: 2026 **ECTS Credits:** 3.0 **Languages:** English

LECTURER

Coordinating lecturer: Athanasios Iossifides (International Hellenic University), Periklis Chatzimisios (International Hellenic University)

Others: Athanasios Iossifides (International Hellenic University), Periklis Chatzimisios (International Hellenic University)

PRIOR SKILLS

MOBCOMM

Basic knowledge of wireless communications, including radio-wave propagation, modulation/coding, MIMO, multiplexing, and multiple access techniques.

REQUIREMENTS

MOBCOMM

Basic knowledge of wireless communications, including radio-wave propagation, modulation/coding, MIMO, multiplexing, and multiple access techniques.

TEACHING METHODOLOGY

Lectures, assignments, labs, project

LEARNING OBJECTIVES OF THE SUBJECT

The purpose of this course is to bridge the gap between the widely adopted IEEE 802.11 variants and the recently developed or under development amendments, focusing on three major technical aspects, i.e., the Physical layer (PHY), the Medium Access Control (MAC) layer, and the new usage models and applications in the coming years.

STUDY LOAD

Type	Hours	Percentage
Self study	48,0	64.00
Hours large group	27,0	36.00

Total learning time: 75 h



CONTENTS

Next-Generation IEEE 802.11 standards

Description:

The course presents the fundamental characteristics of recently released and forthcoming new IEEE 802.11 standards. It starts with an introduction to the IEEE standardization procedure, followed by a review of the 802.11 MAC layer basics and a short description of current 802.11 amendments (PHY and MAC). Next, it focuses on the most significant new amendments, their features, and the corresponding use cases in future wireless communications.

Topics:

Introduction to IEEE 802.11.
IEEE 802.11 basics.
IEEE 802.11be – Enhancements for Extremely High Throughput (Wi-Fi 7).
IEEE 802.11bn – Ultra High Reliability (Wi-Fi 8).
IEEE 802.11bd – Enhancements for Next Generation V2X.
IEEE 802.11bb – Light Communications.
IEEE 802.11bf – Enhancements for Wireless LAN Sensing.
Future directions and conclusion.

Full-or-part-time: 75h

Theory classes: 27h

Self study : 48h

GRADING SYSTEM

Written exams, project/lab reports, and short in-class quizzes. A project assignment to perform after the STC execution will also be evaluated.