

# Summer School

## Enabling Technologies for Industrial IoT 2023

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UNIVERSITÀ  
DI PISA



DIPARTIMENTO DI  
INGEGNERIA  
DELL'INFORMAZIONE



UNIVERSITÉ  
**Grenoble**  
**Alpes**



**Summer School Enabling Technologies for Industrial IoT**  
**6 ECTS (European Credit Transfer System)**

**20 July - 27 July 2023 Lessons- Theory (in presence\* and remote\*\*)**  
**28 July - 12 August 2023 Lessons-Project work (remote\*\*)**

**\*All lessons in presence 20 - 27 July 2023 at Aula D, Polo della memoria San Rossore 1938, Via Risorgimento 19, 56126, Pisa, Italia**

**\*\*Remote mode available via Microsoft TEAMS Virtual Room  
(link sent to enrolled students)**

**Scientific Coordination: Prof. Sergio Saponara**  
**Administrative Coordination: Dr. ssa Sara Andrenucci**

**Lecturers from  
University of Pisa, University of Kiel, University Grenoble Alpes**

All students will receive a certificate of attendance at the end of the course.

In addition, for all students that pass the exam, a 6 ECTS exam will be also registered and they will receive also a certificate of exam passed.

During the period 28/07/2023-12/08/2023 Prof. Sergio Saponara, Prof. E. Mingozi and Prof. G. Manara will assist the students via MS TEAMS for the project work part of the lessons.

The exam will consist in completing a technical report ("the project work"), starting from one of the subjects of the course and integrated with data and infos from student experience, assigned the 27/07/2023 in the afternoon.

If the technical report is completed and submitted within 12/08/2023 the 6 ECTS exam will be registered within 31/08/2023.

If the technical report is completed and submitted after 12/08/2023 but within 25/09/2023 the 6 ECTS exam will be registered within 30/09/2023

The technical report will be analyzed by a committee involving Prof. Sergio Saponara, Prof. E. Mingozi and Prof. G. Manara.

For info: [sergio.saponara@unipi.it](mailto:sergio.saponara@unipi.it)

**20 - 27 July 2023 Lessons- Theory (in presence\* and remote\*\*)**

**L1, Thursday 20 July 2023, 8.30 – 18.30**

**Day on Integrated Circuits and Chipless Solutions for Industrial IoT**

**8.30 – 10.00 Prof. S. Saponara, Prof. G. Manara**

Introduction and syllabus of the Summer School (course structure, subjects of the lessons, final exam, teaching material)

**10.00 - 11.45 Prof. S. Tedjini**

Trends in the design of RFID tags and sensors.

**11.45 - 13.30 Prof. N. Bardot**

New Directions in RFID Reader and Tag Design

13.30 – 14.30 Break

**14.30 - 18.30 Prof. S. Saponara**

Integrated circuits and architectures for Industrial IoT applications: communication aspects

**L2, Friday 21 July 2023, 9.00 – 18.30**

**Day on Basics of Electromagnetics and Sensing Circuits**

**9.00 - 13.30 Prof. S. Saponara**

Integrated circuits and architectures for Industrial IoT: remote sensing aspects

13.30 – 14.30 Break

**14.30 - 16.30 Prof. L. Klinkenbusch**

Electromagnetic propagation issues for Industrial IoT

**16.30 - 17.30 Prof. G. Manara**

Advanced phased arrays for communications in industrial scenarios

**17.30 - 18.30 Prof. S. Genovesi**

Additive Manufacturing for wireless tags and sensors

**Saturday 22 July 2023**

**Prof. S. Saponara, 15.00-17.00**

HELLO WORLD!- L'informatica dall'aritmometro allo smartphone

**Cultural-Scientific event at Le Benedettine - piazza San Paolo a Ripa d'Arno, 16, Pisa**

**L3, Monday 24 July 2023, 9.00 – 18.30**

**Day on Networking for IoT and Industry 4.0**

**9.00 - 13.00 Prof. S. Giordano**

Networking protocols and architectures for IIoT and Cyber Physical Systems

13.00 – 14.30 Break

**14.30 - 18.30 Prof. E. Mingozzi**

Web of Things: architectures, protocols and platforms for IoT applications

**L4, Tuesday 25 July 2023, 9.00 – 18.30**

**RFIDDay(at)Summer School**

**09.00 - 10.30 Prof. A. Buffi**

RFID localization for Industry 4.0: trends and challenges

**10.30 –12.00 Dr. A. Michel**

Advanced antenna design for RFID devices

**12.00 - 13.30 Dr. F. Costa**

RFID for Sensing

13.30 - 14.30 Break

**14.30 - 17.30 Prof. G. Iannaccone**  
RFID circuit & system components

**17.30 - 18.30 Prof. G. Manara**  
Advanced phased arrays for wireless power transfer in industrial scenarios

**L5, Wednesday 26 July 2023, 9.00 – 18.30**

**Day on Applications of 4.0 Paradigm to Smart Industry and Smart Transportation**

**9.00-11.00 Prof. C. Vallati**  
Integration of IoT devices into Cloud computing platforms: methods and practical examples

**11.00-13.00 Prof. G. Anastasi**  
The 6TiSCH Architecture for Industrial IoT Applications

13.00 - 14.30 Break

**14.30 – 16.30 Prof. A. Monorchio (remotely from US, Prof. S. Saponara in presence in classroom)**  
Electromagnetic Information Security for IoT devices

**16.30 – 18.30 Prof. S. Saponara**  
New trends in the internet of autonomous vehicles

**L6, Thursday 27 July 2023, 9.00 – 19.00**

**Day on High Performance Computing**

**9.00 – 11.30 Prof. S. Saponara**  
Embedded High Performance Computing: the EuroHPC and the European Processor Initiative

**11.30 – 13.30 Prof. M. Macucci**  
Ultra-low power circuits and quantum computing paradigms

13.30 – 14.30 Break

**14.30 – 19.00 Prof. S. Saponara, G. Manara**  
Final exercitations and projects assignments

**28 July - 12 August 2023 Lessons-Project work (remote\*\*)**

During the period 28/07/2023-12/08/2023 Prof. Sergio Saponara, Prof. E. Mingozzi and Prof. G. Manara will assist the students via MS TEAMS for the IoT project work part of the lessons.

