

# SUMMER SCHOOL PROGRAMME JULY 1-26, 2024

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TSI

TRANSPORT AND  
TELECOMMUNICATION  
INSTITUTE



**Cyber-Physical  
Systems**

**IoT Networks**

**Networks Security**

**English for  
IT Professionals**



Summer School Programme I

# Cyber-Physical Systems

## IoT Networks

## Networks Security

# Summer School Programme I

Get hands-on experience in the realm of IoT and unleash your potential to drive innovation in the age of Artificial Intelligence!



## Introduction to the Cyber-Physical Systems 40h/2 ECTS

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- Development tools on micro-controller systems
- Programming on micro-controllers - programming in the right language and understanding how to program parallel systems (management of interrupts, clocks, power)
- Programming I2C; SPI; UART interfaces

### Learning outcomes:

- > Flash the memory, debug, analyse the system
- > Select the right microcontroller according to the use case
- > Build a physical prototype



## Introduction TO IoT Networks 25h/1.5 ECTS

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- Low level protocols
- Short range network: Bluetooth; Zigbee
- Mid-range networks: Wi-Fi; Ethernet
- Long range networks: LoRAWan; SigFox; NB-IOT
- High level protocols
- COAP; MQTT
- Cyber-physical systems permanently connected to the Internet

### Learning outcomes:

- > Select the right wireless mediums according to the needs & constraints
- > Dimension the network according to the scale of a cyber-physical system deployment

*Prerequisite:* microcontroller programming course



## Networks Security 15h/0.5 ECTS

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- Securing short, mid & long range wireless protocols
- Securing exchanges between the cloud and the embedded system (TLS, MTLs, certificate management, secret management)

### Learning outcomes:

Upon completion of this course, course participants will be able to architect a secure system.

# Programme I Preliminary Schedule

WEEK 1						WEEK 3							
Time	Monday 1 July	Tuesday 2 July	Wednesday 3 July	Thursday 4 July	Friday 5 July	Time	Monday 8 July	Tuesday 9 July	Wednesday 10 July	Thursday 11 July	Friday 12 July		
10.00-13.10	Welcome Introduc on	Introduc on to the Cyber-Physical Systems				Cultural programme	10.00-13.10	Introduc on to IoT Networks				Cultural programme	
13.10-14.00	LUNCH BREAK						13.10-14.00	LUNCH BREAK					
14.00-15.30	TSI Programme	Introduc on to the Cyber-Physical Systems					14.00-15.30	Introduc on to IoT Networks					
15.30-17.00	Group work / Self-study						15.30-17.00	Group work / Self-study					
WEEK 2													
Time	Monday 15 July	Tuesday 16 July	Wednesday 17 July	Thursday 18 July	Friday 19 July	Time	Monday 22 July	Tuesday 23 July	Wednesday 24 July	Thursday 25 July	Friday 26 July		
10.00-13.10	Introduc on to the Cyber-Physical Systems					Cultural programme	10.00-13.30	Networks Security			Final presenta ons/ Feedback		Cultural programme
13.10-14.00	LUNCH BREAK						13.30-14.30	LUNCH BREAK					
14.00-15.30	Introduc on to the Cyber-Physical Systems			Introduc on to IoT Networks			14.30-17.00	Group work / Self-study			Farewell event		
15.30-17.00	Group work / Self-study												



The practical side of Cybersecurity is usually coding, so there is no option to “touch” your work or its elements in the literal sense. At TSI university it was so interesting to actually do manual work, with the wires and everything, while also to code as well of course!

Sara Bouamama, EPITA (France)  
Summer School participant 2023



# Programme I Details

Join us in Riga, Latvia in July  
and become a part of exciting  
experience in one of the most  
innovative universities in Europe!



## Venue of the Summer School

TSI, Transport and Telecommunication  
Institute  
Valerijas Seiles St.1, Riga, Latvia,  
15 min from the city centre



## Programme Fees

850 EUR per participant

The fees include:

- 4-week classes, workshops
- All study materials, access to the biggest STEM e-library in Latvia will be available online at e.tsi.lv
- Lunch & coffee/tea at TSI
- Cultural activities every Friday

Not included:

- Accommodation
- Breakfasts, dinners
- Transportation card  
(30 EUR per month: all public transports, excl. trains)
- Approx. budget per month - from 400 EUR



## Recommended Accomodation

Students hotel "Duck Republik" is located just across the street from the TSI university. The hotel is around 15 minutes' walk from the city centre, close to the bus, tram and railway station. Hotel has gym, yoga room, chill and study common area, laundry, pool table and board games and international community.







Summer School Programme II  
**English for**  
**IT Professionals**

# Summer School Programme II

The course will be delivered by a team of experienced native English speakers and proficient TSI staff members.

During this 4-week intensive programme we will cover the following topics:

## </> **Week 1 - Technology and Communication**

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**Module 1:** Communicating about Information Technology Covers IT terminology, components, processes, instructions, explanations, and technical writing formats

- Introductions, icebreakers, review of A2/B1 grammar
- Technology vocabulary: Internet vs web, memory terms, common IT abbreviations
- Present simple vs present continuous: Ask and explain processes like web hosting, cloud storage
- Asking technical questions: Formulations for clarification, discussing troubleshooting
- Explaining technical processes: Give instructions on setting up accounts, connections
- Sequencing tasks: Time order words for troubleshooting steps, project phases
- Writing emails and updates: Format, style, language for IT status reports, documentation

## </> **Week 2 - Software and Hardware**

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**Module 2:** Working with Computer Systems, Focuses on hardware/software vocabulary, issues, troubleshooting processes, recommendations, and documentation

- Computer parts vocabulary: Motherboard, RAM, graphics card, peripherals
- Passive voice and imperatives: Polite commands for user guides, device instructions
- Describing device issues: Ways to clearly explain software-hardware problems
- Making IT recommendations: Language for suggesting apps, tools, solutions
- Modals of advice: Should, could, must when providing IT consultation
- Reading troubleshooting guides: Identify issues & solutions from manuals
- Social media posts: Comment and contribute on IT forums, boards

The instructors will utilize a practical, hands-on teaching approach to effectively upgrade students' industry-specific language skills.

## Summer School Programme II



### Week 3 - Programming and Algorithms

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**Module 3:** Understanding Coding and Algorithms Introduces programming concepts, syntax, explaining logic flows, writing precise instructions and comments in code

- Programming vocabulary: Syntax, scripting, compilers, data types, operators
- Sequence words and connectors: Link steps while explaining logic flows
- Conditionals and if/then: Requests related to basic code functions
- Explaining algorithms: Use diagrams and examples to illustrate programming sequences
- Coding instructions: Imperatives and precision language to describe builds
- Reading code samples: Extract key information like inputs, outputs, variables
- Commenting code: Explain functions and rationale behind logic flows



### Week 4 - Jobs and Career

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**Module 4:** Succeeding in IT Workplaces, Builds English skills for IT jobs, experiences, interviews, workplace culture and communication formats on the job

- IT jobs: Applications analyst, web developer, data engineer, scrum master
- Past work experiences: Timelines, background stories, accomplishments
- Job interview questions: Common IT questions and strong responses
- CV/resume writing: Profile, work history, technical skills section
- Formal vs. informal: Compare memos, emails, texts for workplace contexts
- Workplace idioms: Phrases like "cracking the code", "debugging", "server went down"
- Social interaction: Banter, small talk, hospitality, agreements and disagreements



# Programme II Details

The summer school will take place in Riga, Latvia, led by the TSI, Transport and Telecommunication Institute.



## Venue of the Summer School

TSI, Transport and Telecommunication Institute  
Valerijas Seiles St.1, Riga, Latvia,  
15 min from the city centre



## Target Audience

IT students & working professionals in IT sectors - software developers, IT support technicians, systems analysts, program managers etc.  
Students should have a minimum of A2-B1 level, who want to improve their English.



## Programme Fees

**1350 EUR per participant**

The fees include:

- 4-week classes, workshops (80 hours)
- All study materials, access to the biggest STEM e-library in Latvia will be available online at e.tsi.lv
- Lunch & coffee/tea at TSI
- Cultural activities every Friday

Not included:

- Accommodation
- Breakfasts, dinners
- Transportation card  
(30 EUR per month: all public transports, excl. trains)
- Approx. budget per month - 500 EUR



## Recommended Accomodation

Students hotel "Duck Republik" is located just across the street from the TSI university. Hotel has gym, yoga room, chill and study common area, laundry, pool table etc.



## Why Join Us?

This intensive 4-week course aims to equip IT students and professionals with industry specific English skills to communicate confidently in international work contexts.

Through specialized practical modules delivered in morning lessons, students will enhance their technical vocabulary and language skills. Afternoon lessons will provide additional skills practice, workshops, and talks. On Fridays, cultural experiences are planned to showcase Latvia's history. By experiencing Latvia's culture, nature, and cosmopolitan cities, while developing critical workplace English abilities, **students will gain invaluable insight and preparation for today's global IT industry.**

As a growing regional tech hub situated at the crossroads of Northern and Eastern Europe, Riga provides an immersive location for this course. Known as the Silicon Valley of the Baltics, it houses major IT companies and outsourcing centers, start-up incubators, and a skilled talent pool that serves global clientele.

Beyond the vibrant digital landscape, Riga has an 800-year rich history blended with a thriving modern expat culture. **Students can practice their conversational English everywhere** from the historic Old Town to the lively Social Kvarltas where locals and tourists get together to enjoy the Latvian summer.

As the largest metropolis in the Baltics, Riga enables students to **put their technical language skills directly into practice** while also soaking up Latvian food, music, architecture, nature, lifestyle. Exciting day trips are also easily accessible.

By choosing Riga as the destination for this intensive IT English course, **students will boost their technical abilities & gain cultural experiences** to prepare for international IT workplace contexts.







# Riga, Latvia

## Cultural Programme

# Cultural Programme

Latvia represents versatile environment: European metropolis Riga, coastal and historical towns, with unique architecture, countryside, forests & Baltic Sea.



## Riga Old City Tour & Museums

The historical centre of the Latvian capital was inscribed on the UNESCO World Heritage List as 'the finest collection of Art Nouveau buildings in Europe'. Museums dedicated to various historical topics will guide you through the centuries.



## Jurmala City & Sea Coast

Jurmala is the biggest resort city on the shores of the Baltic Sea in a comfortable geographical location, just 20 km from the capital of Latvia, Riga.



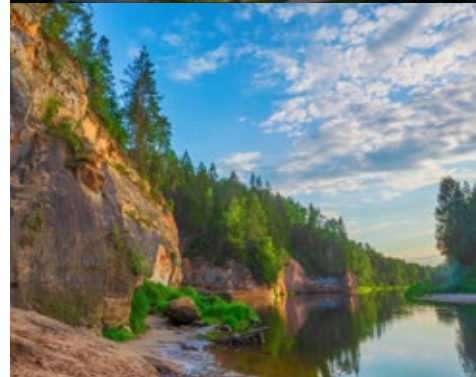
## Cesis City & Medieval Castle

Cesis is one of the oldest towns that directly represents Latvian cultural heritage. Cesis Castle is one of the most iconic and best preserved medieval castles in Latvia.



## Gauja National Park

The Gauja National Park is the largest and oldest of the national parks in Latvia, with the great biological diversity and unique natural, cultural and historical monuments.





## Latvia, Riga

Latvia is an Eastern European country situated in the Baltic Sea region, right between Lithuania and Estonia.

Around 50% of Latvia's territory is covered by forests, making it one of the greenest countries of the EU. Latvia has the benefit of experiencing all four seasons and its magical gifts. With 18 hours of sunlight at the peak of the season, summer time is prime at the country situated at seashore.

Latvia is one of the most technologically advanced nations with the fourth fastest Internet speed in the world. In both urban and rural areas speeds of at least 100 Mbps are within hand's reach, as well as 5G coverage for all large urban areas is in process to ensure even bigger progress.

Latvian national sport is ice hockey, closely followed by basketball. The Latvian men's national ice hockey team achieved a historic milestone by securing their first-ever bronze medal at the 2023 IIHF Ice Hockey World Championship. In a parallel feat of excellence, the Latvian men's national basketball team attained an unprecedented 5th place at the 2023 FIBA Basketball World Cup.

Latvian cuisine is renowned for its natural ingredients, unique flavour combinations and exceptional service. Many people enjoy growing their own fruits and vegetables or harvesting wild berries and mushrooms from the forests. In 2023, a Latvian restaurant has been awarded a Michelin star for the first time.





**TSI is the only private technical university of applied sciences in the Baltics, which combines an exceptional approach with a versatile international community.**

## **TSI, Transport and Telecommunication Institute**

Creating a modern and dynamic environment, TSI is the university where a unique fusion of technology, innovation, and science works effectively towards preparing socially beneficial specialists for high-demand roles in IT, Robotics, Computer Engineering & Electronics, Aviation, Logistics and Business & Management.

In cooperation with the UWE Bristol university (UK), TSI designed double degree programmes that provide education in accordance with the world-class UK quality standards in the fields of artificial intelligence, data analytics and aviation management.

TSI offers a wide range of scientific, professional and networking events and activities, and aims at merging traditional education with an innovational approach.



**I recommend getting to know and joining TSI community as both within courses & friends you make – you feel welcomed. And that's one thing, that as I think, any foreign student would want to feel.**

*Robert Nantchouang,  
EPITA (France)  
Summer School participant 2023*



**Conquer intellectual  
challenges**

**Upgrade to a new  
achievement**

**Meet new friends &  
inspire from professionals**

**Connect with like minded peers  
and supportive mentors**

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