# Summer School Learning Plan

## „Smart city 2022"

"The Smart City 2022" Summer School continues the idea of previous Summer Schools – to see STEM from a different, unprecedented perspective, be curious, creative and entrepreneurial in designing your life and your vision of a smart city.

The main questions we will seek to answer through the school's activities are: how do smart technologies create a convenient life? Why STEM + business = innovation?

The Summer School activities should spark curiosity and a desire to create smart environments for ourselves and for people. The girls will learn by asking questions, finding creative solutions, and working together with the school's faculty and university researchers. The main goal of the school activities is to develop the girls in STEM fields, to experience a sense of success in the "here and now" by designing and creating a mini project with Arduino, to motivate them to go deeper into STEM and entrepreneurship, to spark their curiosity to question, to go deeper, to explore, and to create in the pursuit of new values.

# Vilnius university GEM Summer School

**Target Group:**

Participants are girls aged 12-14 from Vilnius schools.
Negotiations are underway with the Kharkiv school in Vilnius during the war period for the participation of 10 girls in the summer school.

**Venue:**

Vilnius University Business School (Saulėtekio al. 22, LT-10225) https://www.vm.vu.lt/
- Meeting room
- Computer room
- Workshop laboratories

Scientific Communication and Information Centre (SCIC) https://biblioteka.vu.lt/vietos/mkic
- Café
- Meeting room

**Transportation to the venue / digital access to the Summer School:**

Participants will arrive at the school by public transport or by their parents/guardians in their own transport.

**Subsistence:**

Participants will receive a lunch each day, funded by the project.

**Contact person for girls and their guardians:**

Asta Meškauskienė asta.meskauskiene@fsf.vu.lt

# Schedule

| 20 June | |
|---|---|
| 13.00 – 13.45 | Registration of participants |
| 13.45 – 14.00 | "Welcome to the world of STEM" |
| 14:00 – 14:30 | Let's meet. Students at the Institute of Education Science |
| 14:45 – 16:45 | Visit to the Museum of Energy and Technology<br>Educational program "How did the light bulb go on for Tom?" https://www.etm.lt/ |
| 17.00 – 18.00 | How to live more comfortably? STEM activities with Arduino |
| **21 June** | |
| 10:00 – 12.00 | Idea generation. Mini project ideas |
| 12:00 – 13.00 | *Lunch* |
| 13.00 – 14:00 | Success story. Meeting with businesswomen |
| 14:00 – 15:00 | Students at the Institute of Education Sciences. Explaining how to use 3D pencils and hot glue, testing |
| 15:10 – 18:00 | Building and programming models with Arduino |
| **22 June** | |
| 10:00 – 12:00 | Creating and testing models with Arduino (3D pencils, hot glue) |
| 12:00 – 13:00 | *Lunch* |
| 13:00 – 15:00 | Preparing posters and presentations |
| 15:00 – 16:00 | It's exciting to be a scientist!  A discussion with women scientists from Vilnius University |
| 16:00 – 17:30 | Presentation of projects. Reflections |
| 17:30-18:00 | Closing of the school |
| | |

# Learning Activities

| Learning Activities | STEM/ICT subject knowledge | Knowledge of inspiring role models and their meaning | Knowledge about the STEM/digital world of work | Entrepreneurial mind-sets | Transversal skills |
|---|---|---|---|---|---|
| Visit to the Museum of Energy and Technology. Educational program "How did the light bulb go on for Tom?" | + | + | | + | + |
| How to live more comfortably? STEM activities with Arduino | + | | + | + | + |
| Idea generation. Mini project ideas | + | + | | + | |
| Building and programming models with Arduino | + | | + | | + |
| Students at the Institute of Education Sciences. Explaining how to use 3D pencils and hot glue, testing | | + | | | + |
| Creating and testing models with Arduino (3D pencils, hot glue) | + | | | + | + |
| Preparing posters and presentations | + | | | + | + |
| Presentation of projects. Reflections | + | + | + | + | + |
| Success story. A discussion with businesswomen | | | + | + | + |
| It's exciting to be a scientist! A forum with women scientists from Vilnius University | | + | + | + | + |

The Summer School will start with a Welcome to STEM World greeting and getting-to-know-you games - girls will get to know the GEM team and each other. It is very important to have fun and engaging experiences at the beginning of the school, which encourages the participants to come together. To this end, a visit to The Museum of Energy and Technology will take place. Is an exciting leisure space that brings together unique industrial heritage, interactive science education and cultural events under one roof. During the visit, the girls will take part in an educational program "How did the light bulb go on for Tom?" The educational program will explore the benefits of electricity, the physical principles of how it works and, most importantly, you can feel just like Tom Edison as you build your own light bulb! https://www.etm.lt/edukacijos/.

On the same day, there will be a discussion on *How to live more comfortably?* The girls will discuss the role of artificial intelligence, smart technologies for a comfortable life, and ideas ranging from the fantastical to the mundane with the school's speakers. Ideas for mini projects, a very engaging and creative process, generating ideas through mini project sketches and working groups of girls. On the second day of the school, the workshop will involve building and programming models using Arduino kits. The third day will continue with the creation of the models, their testing and aesthetic decoration using 3D pencils and hot glue. The girls will prepare posters to present the value of their model, the STEM skills they needed to create it, what they learned, and the business ideas that came out of the creation of their model. The school activities will culminate in a mini-project presentation and reflection.

In addition to the project development activities, meetings with women entrepreneurs and scientists are planned to share inspiring success stories. Discussion "*It's fun to be a scientist!*" with women scientists from Vilnius University, who will talk about what it means to be a scientist, what challenges and stereotypes they have faced and how they have dealt with them, and what makes a career as a scientist fascinating. Businesswomen will share their experiences on how business start-up ideas are born, what character traits and stages of business development are important, and what you need to do now to become a successful entrepreneur.

Key learning methods: discussion, project-based learning, research, creative activities, problem-solving, teamwork and collaborative learning.

GEM summer camp in Lithuania will contribute to the project's objectives and promote:
- Girls with knowledge of inspiring role models and their meaning.
- Girls with knowledge about the STEM/digital world of work.
- Girls with entrepreneurial mind-sets.
- Girls with transversal skills.

## Lecturers and mentors

**Valentina Dagienė** – Professor at Vilnius University. Main areas of activity: formulation of directions for the implementation of computer science and information technologies in schools, development and systematization of terminology, technological tools, and methods for teaching programming (algorithmic), research and experimental development of educational and training software localization. In the summer school, they will take part in discussions and mentor girls in the development of mini projects.

**Anita Juškevičienė** – PhD in Computer Science, researcher, Vilnius University Institute of data sciences and digital technologies. Research interests: programming, computational thinking, she is coordinating the main activities of the school - building models with Arduino.

**Aušra Kynienė** - Doctor of Natural Sciences (Physics), Research Fellow at the Department of Atomic Theory, Institute of Theoretical Physics and Astronomy, Vilnius University. Research interests: atomic theory and atomic spectra. Relativistic and many-electron effects in atoms, interaction of electrons and photons with atoms, study of processes in astrophysical and laboratory plasmas. She is responsible for organizing school activities and will advise the girls on programming models.

**Asta Meškauskienė** – Associate professor at the Institute of Educational Sciences of Vilnius University, Doctor of Social Sciences, research interests: educational innovations, learning methods, non-traditional learning environments. She is the head of the Centre for Teacher Competence Development. She is the project leader responsible for the implementation of the summer school program.

**Daiva Viskontienė** - Director of Business Machinery Company. The company introduces innovative solutions for modern business that make it more efficient, modernised, and cost-effective not only in terms of time, but also in terms of labour costs. It provides innovative solutions and technologies for smart education and implements specialised digital content solutions. She will participate in a meeting with the participants of the summer school and present her career as an entrepreneur.

**Olga Kurasova** – professor, Institute of data science and digital technologies, Vilnius university. Research interests: artificial intelligence, data mining, multidimensional data visualisation, big data analysis, artificial neural networks, machine learning, multi-criteria optimisation, evolutionary algorithms, image processing, optimisation methods. She will participate in a meeting with the participants of the summer school and present her career as a researcher.

## Vilnius university GEM Summer School Support Site

You can find more information about the Summer School in the national language by following this link:
https://www.fsf.vu.lt/naujienos/fakulteto-ivykiai/4664-vasaros-mokykla-ismanusis-miestas-2022