Hi, I'm going to help you with Photonics and Quantum Materials, cohort 2026 curriculum!

You can find out your curriculum here ↗

Here's the content:

Basics of curriculum
Compulsory part
Elective part
Pick the course wisely

Case study

These cases are based on the most frequently asked questions

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Let’s start from the basics:

What you must do during 2 years of study?

- get 120 ECTS credits and reach these numbers of ECTS credits for each stream
- cover all compulsory elements under each stream
- prepare and defend your Thesis

1 ECTS credit = 27 astronomical hours

Skoltech curriculum plan has five Streams:

- Stream 1 (STE) – 36 ECTS credits
- Stream 2 (Sector) – 12 ECTS credits
- Stream 3 (E&I) – 12 ECTS credits
- Stream 4 (Research & MSc Thesis Project) – 36 ECTS credits
- Stream 5 (Options) – 24 ECTS credits

On top of 120 ECTS credits you may take “Extracurricular activities” – maximum 20 ECTS credits overall, maximum 10 ECTS credits per year.

Your load per term must be minimum 12 and maximum 18 ECTS credits. During one academic year your load should not exceed 60 ECTS credits + 10 ECTS credits for “Extracurricular activities”.

Let’s talk about the compulsory part

These are the educational elements that you must complete.

- **The list of these educational elements will not be changed during 2 years of studies!**
- **No need to register for Stream 1 (STE) compulsory courses. You will be registered by default by the Education Department.**

You have compulsory:

12 ECTS credits in Stream 2 (Sector)	
Industrial Immersion	12
6 ECTS credits in Stream 3 (E&I)	
Innovation Workshop	6
36 ECTS credits in Stream 4 (Research & MSc Thesis Project)	
Early Research Project	6
Thesis Research Project	12
Thesis Proposal	3
Status Review	3
Predefense	3
Thesis Defense	9
15 ECTS credits in Stream 5 (Options)*	
Additional Thesis Research Short-Term Project	15

* Please note that in Stream 5 (Options) there are 15 ECTS credits referring to 2 courses (Additional Thesis Research and Short-Term Project). This means that students must earn 15 ECTS credits in total within this compulsory part of Stream 5, while the distribution of credits between these 2 elements may vary depending on the student’s research trajectory. E.g.: you could take 9 ECTS credits for Additional Thesis Research and 6 ECTS credits for Short-Term Project (or vice versa). Do not forget to register in Canvas registration quiz.

Let's discuss the elective part:

The list of the elective courses might be updated. So check Course Catalog ↗ before each registration and Drop/Add period.

You have elective:

18 ECTS credits in Stream 1 (STE)

Quantum Mechanics	3
Fundamentals of Photonics I	3
Basics of Applied Numerical Analysis	3
Introduction to Nanoscience and Engineering	3
Fundamentals of Photonics II	3
Photonics Research Seminar Series	3
Aerosol Science and Technology	3
Experimental Optics I	3
Introduction to Solid State Physics	6
How to Formulate and Solve Real-World Physical Problems	6
Applied Physics in Biomimetic Structures	3
Fabrication Technology of Nanodevices	6
Methods of Experimental Physics (Practical Course)	6
Carbon Nanomaterials	6
Two-Dimensional Materials	3
Atomic Processes at Crystal Surfaces	3
Physics of Colloids and Interfaces	6
Review of Materials and Devices for Nano- and Optoelectronics	3
Review of Materials and Devices for Nano-and Optoelectronics 2	3
Design of Chemical Sensors: from Fundamentals to Applications	3
Optoelectronic Devices with Novel Functional Materials	3
Superconducting Quantum Technologies	6
Nanooptics	3
Introduction to Optical Biosensors	3
Photonics Devices and Applications	3
Engineering the Interaction of Light with Matter at the Nanoscale	3
Laser Physics	3
Optical Communications. Basics	3
Integrated Silicon Photonics	6
Quantum Optics	3
Optical Communications. Applications	3
Biomedical Application of Photonics	6
Experimental Optics II	3
Physics and Applications of Optical Frequency Combs	3

6 ECTS credits in Stream 3 (E&I)

Entrepreneurship and Innovation Courses from Course Catalog	6

9 ECTS credits in Stream 5 (Options)

English Toolkit	3
Academic Writing Essentials	3
Nobel English for Academic Purposes	3
First Steps to Thesis in English	3
Master Your Thesis in English	3
Master Your Defense in English	3
From Lab Results to IP	3
Electives from Course Catalog	

How to pick the elective course wisely?

1. Read course Syllabus which is available in Course Catalog. ↗
2. Keep in mind your workload per term. It must be between 12–18 ECTS credits.
3. Discuss the list of elective courses with your Research Advisor.
4. Check the course schedule, so the courses of your choice do not intersect.
5. Take into account course prerequisites. Hard prerequisites (specific course or courses) are indicated in curriculum, so students can plan their educational path. Hard prerequisites must be completed before you take the course.

MA030143	MA030177	Физика лазеров	Laser Physics	3

6. Some courses you may plan for Year 1 or for Year 2. Number of ECTS credits under the specific Term means that this course is recommended to be taken this Term, “X” means that you can still take the course later.

Introduction to Optical Biosensors	3		3			X	
Photonics Devices and Applications	3		3			X	

Pay attention to: Term 1 registration

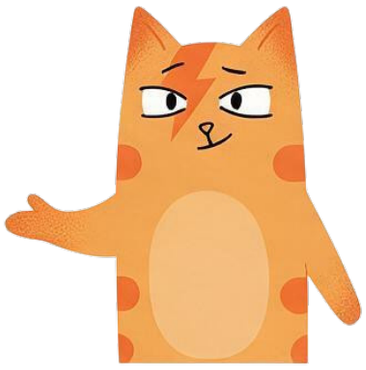
Term 1A (4 weeks in September) – you have a compulsory 6-credit "Innovation Workshop" course. No need to register. You will be registered by default by the Education Department.

Innovation Workshop	6	6	

So, in Term 1 you already have 6 compulsory ECTS credits. In addition to this, in Term 1B (4 weeks in October) you must receive at least 6 ECTS credits more in the elective part. So, you have to pick up a course of your choice and register for it. The registration timeline is here. ↗

Innovation Workshop

What should I do if I'm a foreign student and I arrive late for "Innovation Workshop" (IW) due to valid reason?



In this case you are allowed to take "Innovation Workshop" in the second year of studies.

What if I can't attend "Innovation Workshop"?

Attendance is mandatory. If you do not have a valid reason (e.g. medical report) and you do not attend IW, you might get an unsatisfactory grade. In this case the Disciplinary Board will be involved.

Term 8

Term 8 is the final term of your educational program, so during it students are expected to work on their thesis only. For this reason make sure that all course workload is completed by the end of Term 7. In Term 8 you are allowed to take only courses related to your thesis.

Master Your Defense in English	3

Multi-term courses

How the workload is spread for a multi-term course?

The workload of a multi-term course is spread equally among the terms.

In the elective "STE" part you have a 3-credit multi-term "Photonics Research Seminar Series" course in Terms 2, 3 and 4. Your workload will be 1 ECTS credit for each term for this course. You may also take this seminar during the second year of studies.

Photonics Research Seminar Series	3		1		1	1		X	X	X

When should I register for a multi-term course?

In order to get ECTS credits for a multi-term course you have to attend the course during all the terms as per curriculum plan!

You can register for a multi-term course only before the first term when the course starts. You can drop this course only during the Drop/Add period of the first term when the course starts.

Grouped courses in STE

Why courses are grouped in the elective part of “STE”? Can I take courses from different groups?

In the elective part of “STE” there are 3 groups of courses: General, Nano and Quantum Technology and Applied Photonics. Grouping courses serves for navigation purposes only and aims to show that each group is related to a particular topic. There’s no need for a student to stick to one group when choosing a course, so you can freely take courses from different groups.

Electives from Course Catalog

Can I take a course which is not in my curriculum plan?

Yes, you can take a course which is not in your curriculum plan via “Electives from Course Catalog” educational element which is located in Stream 5 “Options” and “Extracurricular activities”.
However, keep in mind the following when registering for a course which is not in the curriculum plan:

- Course instructor has the right to limit the range of programs, students of which he/she is ready to take on the course. This info is in Syllabus, check it before registering;
- Such a course can be allocated only in Stream 5 “Options” or “Extracurricular activities” (NOT Stream 1 “STE”).

Why does “Electives from Course Catalog” appear in “Options” and “Extracurricular activities”?

This is done intentionally. So, you can take more courses from Course Catalog if you would like. Some will count in “Options”, some in “Extracurricular activities”.

E&I courses from Course Catalog

Where can I find all E&I courses?

You may find all E&I courses in Course Catalog ↗ on the website under the E&I filter. The course Syllabi are also in there.

Additional Thesis Research & Short-Term Project

What is the difference between “Additional Thesis Research” and “Short-Term Project” in terms of course content?

“Additional Thesis Research” is an additional research related to your Thesis, “Short-Term Project” is a research related to a project/research different from your Thesis.

Moving the course from one Stream to another

Can I move a course from Stream 1 (STE) to Stream 5 (Options)?

Yes, you can easily do it. It might be relevant if you already have more credits in Stream 1 (STE) than it's needed.

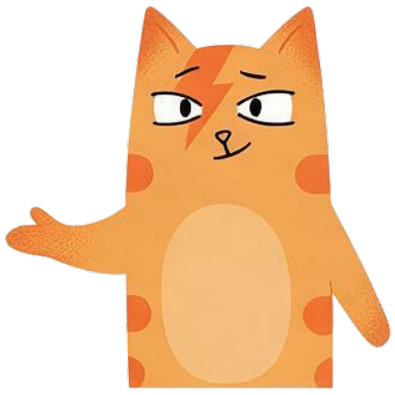
Can I move a course from Stream 5 (Options) to Stream 1 (STE)?

No, you can not move a course from Stream 5 (Options) to Stream 1 (STE) but you can move such a course to "Extracurricular activities".

Please inform the Education Department which courses need to be moved.

Low grade

I received a low grade for the course and I do not want to show it in Transcript, is it possible?



It’s not possible. In Transcript you will get all grades for all courses taken.

Can I retake the course if I get a low grade?

You can retake only a compulsory course if you get an “F” grade. With any other grade no course can be retaken.

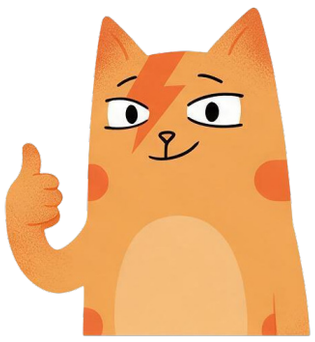
Course Schedule overlaps

I take two courses and the schedules of these courses overlap. What to do?

Please keep in mind that it is your responsibility to make sure you have no course overlaps. If the Education Department notices that there is an overlap in your schedule, the overlapping course will be dropped by our choice.

Free listener

Can I take a course in a free listener role?



Yes, you can but only with the course instructor's permission. If you get "ok" from the course instructor, inform the Education Department about your case by sending an email to education@skoltech.ru, copy the course instructor. Education will add you on a Canvas course page, so you have access to course materials. Keep in mind that the Course Instructor does not check the attendance, does not assess homework assignments, or other assignments for listeners.

ISP

What is ISP? Why does it have no credits in the curriculum plan?

Independent Study Period (ISP) is a special curriculum element, which lasts for 3 weeks in Winter Term (January) and consists of a variety of courses that help students to explore their interests beyond their main educational fields and make their academic learning truly interdisciplinary. Please note that ISP workload is counted in astronomical hours (not in ECTS credits). ISP is mandatory for MSc-1 students, so they must gain between 90 to 120 hours to get a “pass”. To find out more on ISP, please follow the presentation (ISP 2026).

Other questions

I have some other questions on my education in Skoltech, where should I go?

Here are some contacts:

- **Education Department office: E-R1-2064 (education@skoltech.ru)**
- **Program Director: Associate Professor Gladush Yuriy (y.gladush@skol.tech)**
- **Program Coordinator: Assistant Professor Cvjetinovic Julijana (julijana.cvjetinovic@skoltech.ru)**
- **Program Manager: Senior Specialist for Education and Administration Abazian Ekaterina (e.abazyan@skoltech.ru)**