Materials Science
M.Sc. education program

crei.skoltech.ru/cest/education/materials-science-program

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Where to get information

Where to look:

- crei.skoltech.ru/cest/education/materials-science-program

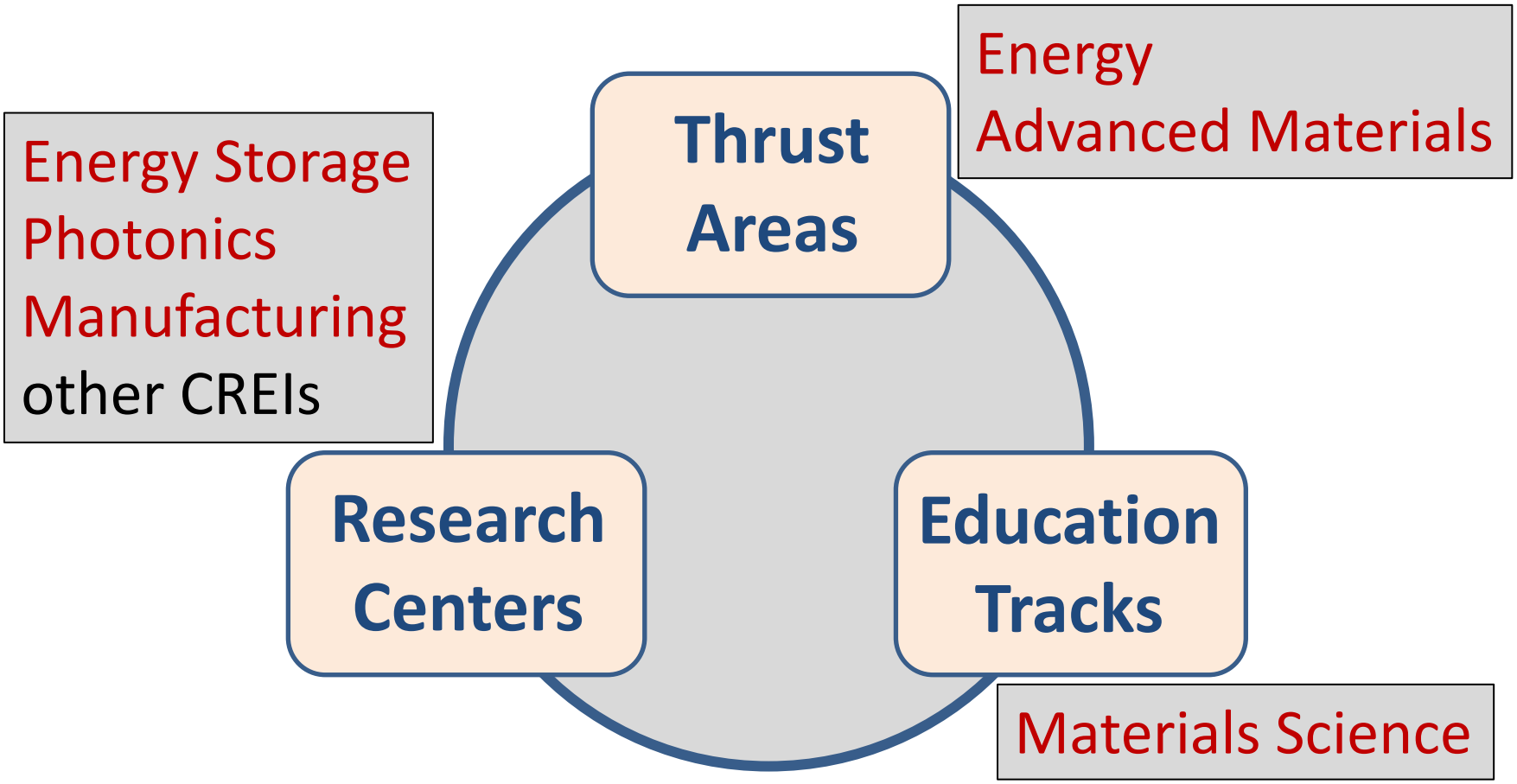
Whom to ask:

- Your academic/research advisor
- Program Coordinator – Andriy Zhugayevych
  - Experimental Materials Science – Artem Abakumov
  - Computational Materials Science – Andriy Zhugayevych
- Education Office

For other contacts see the program web-page (above)

Skoltech research & education environment

- No separate theory or experiment departments
- No separate physics or chemistry departments



Materials Science track: courses

Core courses

- Survey of Materials **(Term 1B)**
- Materials Chemistry **(Term 2)**

Experimental Materials Science

Recommended courses

- Introduction to Solid State Physics**(2)**
- Material Structure Characterization Methods **(3)**
- Organic Materials for Electronics, Energy Conversion and Storage **(3)**
- Carbon Nanomaterials **(3)**
- Electrochemistry **(4)**
- Materials Selection in Design **(5)**

Computational Materials Science

Recommended courses

- Computational Chemistry and Materials Modeling **(2)**
- Structure & Property of Materials **(3)**
- Advanced Materials Modeling **(4)**
- Materials Selection in Design **(5)**
- Advanced Solid State Physics **(6)**

Elective courses

- discuss with your advisor

Materials Science track: other activities

Understand your load:

- 1 full course = 20 hours per week (except for Term 1B)
- *Hint*: combine research and education

Seminars (1 hour per week):

- Research Seminar "Advanced Materials Science" – core
- Energy Colloquium – optional
- Computational Materials Science seminar – for subtrack
- Your group seminars – per advisor

Background courses (half-course per term):

- Math for Engineers, Quantum Mechanics (Term 1B!)
- English, Writing, Presentation, Pedagogy

Introductory courses from other programs (see webpage)

Advanced courses (see webpage)

M.Sc. Research in Materials Science

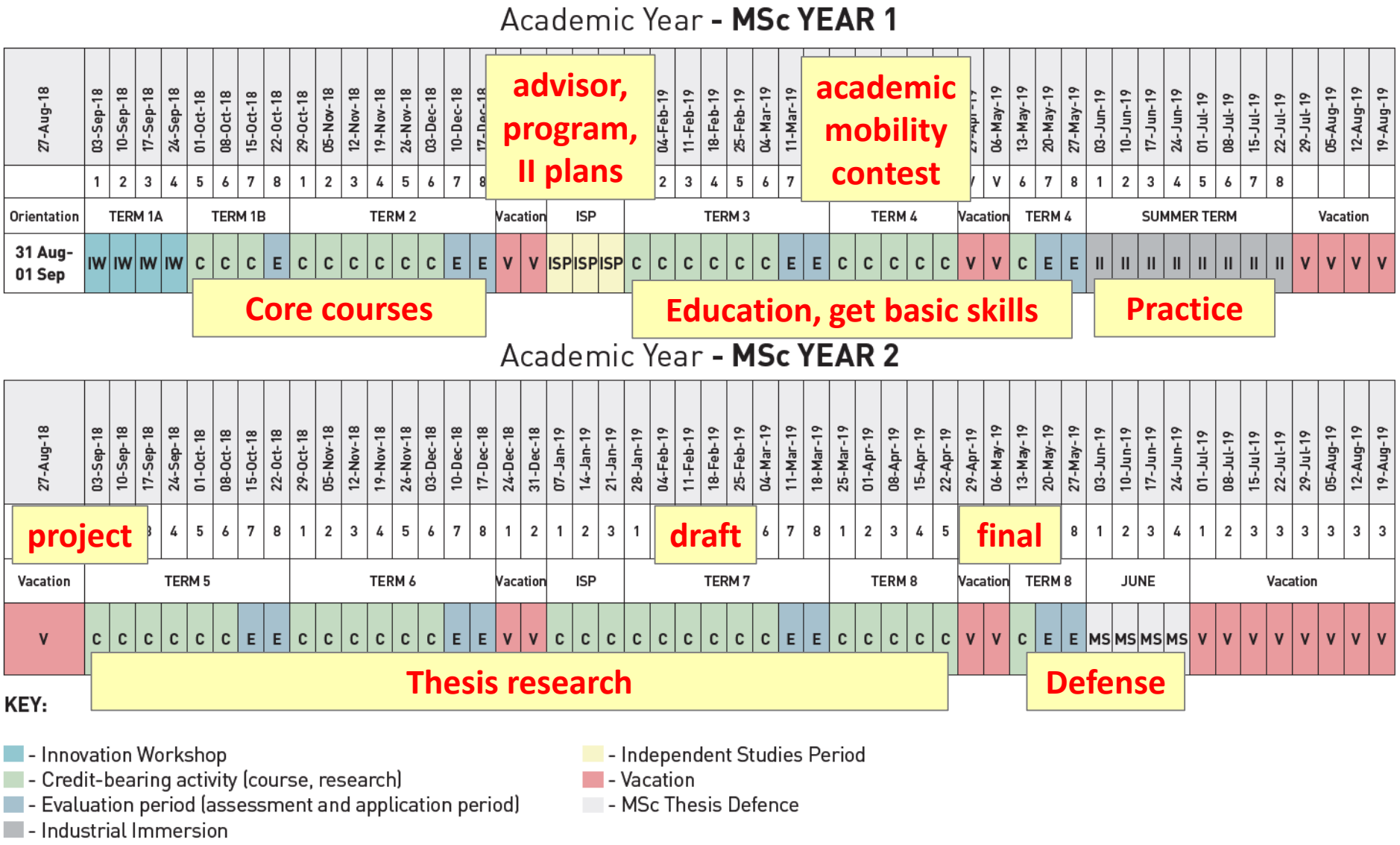
In brief

- *Highly interdisciplinary*
- Experimental Materials Science with most publications on:
  - energy storage – Abakumov, Antipov, Stevenson
  - optoelectronics including solar cells – Nasibulin, Troshin
  - materials engineering – Korsunsky
- Computational Materials Science with most publications on:
  - methods – Gonze, Levchenko, Shapeev
  - applications – Oganov, Tretiak, Zhugayevych
  - theoretical chemistry and physics – Buchachenko, Fine
- *… with details on faculty web-pages: example*
- Research topics will be covered on Survey of Materials course

M.Sc. Thesis 2016-2019

- Materials for energy conversion and storage (22 students)
- Materials for optoelectronics (4 students)
- Other materials and computational methods (7 students)

Academic calendar and important deadlines



Approximate plan for first 5 months

Term 1A:

- Innovation Workshop (40 hours per week)

Term 1B:

- Survey of Materials course (40 hours per week)
- Either 3-credit background course (if needed)
  or seminars (at least 1 per week for 2 years)

Term 2:

- Materials Chemistry course (20 hours per week)
- Another 6-credit course (Intro to Solid State Physics, Computational Chemistry and Materials Modeling etc.)
- Optionally 3-credit research or elective course

January:

- Choose advisor and research field, plan next 6 months
- ISP courses if needed or research