

**Skolkovo Institute of Science and Technology, Skoltech**  
<http://www.skoltech.ru/>

**Course “Space Sector”**

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**Guest lecturers:**

Professionals from among the acting or former leaders of the NASA, Roscosmos, and ESA, founders of aerospace companies, and heads of the world’s leading research organizations.

**OVERVIEW**

This course examines the domain of space from multiple vantage points — space as a business, a way of life, as industry, and as a fulfillment of human dreams. In addition, it examines space-related issues that drive key international regulatory, economic, and global policy. To gain insight into these different dimensions, we examine space through three different lenses: sub-sectors, technologies, and organizations.

**Part 1: History and Organizations**

- History
- Space Sector Agencies, Organizations and Plans
- “New Space”

**Part 2: Sub Sectors**

- Launch services and markets
- Satellite manufacturing and operations, including sensors and payloads
- Earth observation and geodesy
- Space communications and navigation services
- Space science payloads and missions
- Human spaceflight, programs and policies

**Part 3: Technologies:**

- Technology readiness, and sources of technology, technology planning
- Launch technologies and options
- Satellite technologies
- Payload technologies

- Space Robotics

In addition, we cover several tools helpful in exploring a sector: system thinking, critical thinking, the economics of a firm, how firms compete and the value chain in the development of a product.

Because of the availability of speakers, the course schedule does not exactly follow this outline. In addition, some speakers may cover both a sector and its technology (e.g. launch sector and launch technology).

### **Learning Outcomes**

The learning outcomes are that a student should be able to

- Describe the main sub-sectors or services within the space business
- Analyze the main technologies employed and assess the technological barriers
- Estimate the parameters of the business models of each of the sub- sectors, and where value is generated and how, including traditional and “new” space
- Describe the funding of R and D, regulation and government programs in space
- Characterize the national differences in demand for space services and capability to build and operate national programs, and contribute to international efforts.
- Integrate into an analysis that indicates desirable segments for future commercial and national development.
- Propose potential products, and critically analyze their potential success in the market