

Course Name *Atmospheric aerosols in environment*

Course Overview

Level of study	<i>Bachelor Degree или Master Degree</i>
Workload	ECTS: 4 Total Hours: 69 Contact Hours: 44 <ul style="list-style-type: none"> • Lectures: 16 • Labs: 28
Course Code	
Semester	<i>Winter, Summer</i>
Prerequisites	<i>ecology, chemistry, geochemistry, geoecology, methods of research material composition of natural objects, mineralogy, atmospheric environment, atmospheric chemistry, environmental chemistry</i>
Course Objectives	<i>to get knowledge about different atmospheric aerosol properties at local, regional and global scale.</i>
Learning Outcomes	<p><i>Having successfully completed this module, you will:</i></p> <p><i>know:</i></p> <ul style="list-style-type: none"> • <i>the terminology relating to the atmospheric aerosol,</i> • <i>sources of aerosols, aerosol formation processes and aerosol classification,</i> • <i>aerosol effects on climate change,</i> • <i>remote sensing and ground-based instruments to monitor aerosols,</i> • <i>human health effects of aerosols,</i> • <i>analytical support used to determine of chemical and mineral composition of aerosols,</i> <p><i>get practical skills:</i></p> <ul style="list-style-type: none"> • <i>in snow sampling and preparation to study aerosols,</i> • <i>in determination of chemical composition and mineralogy and origin of anthropogenic aerosols</i>
Syllabus	<p><i>Lectures:</i></p> <ol style="list-style-type: none"> 1. <i>Theme 1. Introduction. Exertion in the laboratories of Innovation, training and research center « Uranium geology ».</i> 2. <i>Theme 2. Principal concept of aerosol study.</i> <ul style="list-style-type: none"> • <i>Atmospheric aerosol types.</i> • <i>Remote sensing and ground-based aerosol networks.</i> • <i>Human health effects of aerosols.</i> 3. <i>Theme 3. Ecological characteristic of Tomsk region</i> <ul style="list-style-type: none"> • <i>Physiographic characteristic</i> • <i>Pollution sources.</i> • <i>Environment impact assessment.</i> 4. <i>Theme 4. Contamination monitoring of snow cover.</i> <ul style="list-style-type: none"> • <i>Snow survey.</i> • <i>Snow sampling and preparation.</i> 5. <i>Theme 5. Mineralogy and origin of atmospheric particles in the industrial area.</i> <ul style="list-style-type: none"> • <i>Methods.</i> • <i>Dust load.</i> • <i>Mineral and anthropogenic particles in aerosols.</i> 6. <i>Theme 6. Elemental composition of aerosols in snow.</i>

	<ul style="list-style-type: none"> • <i>Material and methods.</i> • <i>Trace elements concentration in dust aerosol.</i> • <i>Radioactive elements concentration in dust aerosol.</i>
Labs	<ol style="list-style-type: none"> 1. <i>“Aerosol study in EC (by the example of any country)”.</i> 2. <i>“Ecological characteristic of European city”.</i> 3. <i>Study mineralogy and origin of aerosols from impact areas of Tomsk-city plants.</i> 4. <i>Ecological-geochemical assessment of Tomsk-city territory on based of aerosols in snow chemical composition study.</i> 5. <i>Study radioactive elements concentration and its modes of occurrence in aerosols by f-radiography method.</i>
Projects	
Assessment	<i>Credit Test</i>
Resources	<p><i>Kondratyev K.Ya., Ivlev L.S., Krapivin V.F., Vatotsos C.A. Atmospheric aerosol properties: formation, processes and impacts – Springer, 2006.</i></p> <p><i>Levin Z., Cotton W.R. et. All. Aerosol pollution: impacts on precipitation – Springer, 2009</i></p> <p><i>Yazikov E.G., Talovskaya A.V., Nadeina L.V. Geoecological environmental monitoring: coursebook. – Tomsk: TPU publishing house, 2013. – 135 p.</i></p>
Instructors	<i>Anna Talovskaya, associate professor, PhD</i>