Course	**CS30A7380SS, Systematic Creativity –TRIZ Basics, 3 ECTS credits**
Year and period	M.Sc. 1−2, 13 − 17.1.2020, intensive
Teacher(s)	Professor Leonid Chechurin, LUT University
Aims	After having completed the course, student will be able to: - recognise the role, place and institutions of invention in innovation process/business, - recognise the trends of technology/technical system evolution, - model a problem situation as a contradiction and apply standard methods of their resolving, - model a problem situation as Su-Field triple and apply standard SuField transformations, - formulate the model of inventive (to be) solution, - organise effective search/adaptation of the inventive solution.
Content	Introduction: creativity, invention, innovation. Creativity obstacles and supporters. Place of creativity in modern economy. Invention and Innovation. Basic institutions of invention: know-how, patent, public good (paper). Thinking inertia and other invention killers. Tools for creativity support and place of TRIZ among them. Genrich Altshuller and the history of TRIZ. Part 1. Trends of Engineering System Evolution (TESE) Altshuller's finding: evolution patters engineering systems. S-curve evolution trend, Trend of ideality increase, Dynamisation, Functionality Increase, Transition to Macrollevel etc. Applications to technology intelligence and system design. Part 2. Ideal Final Result concept Axiom of Ideality in TRIZ. Formulation, examples. Operation time, operation zone. 3 ways to reach IFR. Ideality and system reduction (trimming). Part 3. Contradiction analysis and elimination.

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<tr><td></td><td>Invention as contradiction elimination. Engineering contradictions and elimination standards. Altshuller Matrix. Physical contradictions and elimination standards. Separation principles. Case studies and examples, Hands on.

Part 4. SuFiled modeling and transformation
Modeling of interactions in engineering system by subject-object-action triple. Substabce-Field. Standards for SuField model transformations. Case Studies, examples, Hands on.

Part 5. Algorithm
Algorithm of inventive problem analysis (simplified ARIZ). Case studies. Project presentation.

Conclusion

The course is proposed to be suitable also for doctoral studies.</td></tr>
<tr><td>Modes of Study</td><td>- Lectures and exercises 24h
- Team work and a limited project work 20h
- Presentations of the results of the team work/ project work 8h
- Independent work, reading 26h

Total workload 78h.</td></tr>
<tr><td>Evaluation</td><td>Final grade 0-5:

Attendance 30%
Test 30%
Assignment - report on project 40%</td></tr>
<tr><td>Study Materials</td><td>Hand outs of lecture notes, internet resources in open access (given).</td></tr>
<tr><td>Schedule</td><td>
<table>
<tr><td></td><td>week</td><td>day</td><td>time</td><td>lecture hall</td></tr>
<tr><td rowspan="5">Lectures</td><td rowspan="5">13–17.1.2020</td><td>Monday 13.1</td><td>8 – 17</td><td>6521</td></tr>
<tr><td>Tuesday 14.1</td><td>8 – 17</td><td>6428</td></tr>
<tr><td>Wednesday 15.1</td><td>8 – 14</td><td>1326</td></tr>
<tr><td>Thursday 16.1</td><td>8 – 17</td><td>7439</td></tr>
<tr><td>Friday 17.1</td><td>8 – 17</td><td>7439</td></tr>
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No final exam after the course.</td></tr>
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