LUT
Lappeenranta
University of Technology

Course	**Systematic Creativity - TRIZ Basics, 3 ECTS credits**
Year and period	M. Sc. 1-2, 16-20.7.2018
Teacher(s)	Prof. Leonid Chechurin, LUT
Person(s) in Charge	Prof. Leonid Chechurin, LUT
Aims	After having completed the course, student should 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. 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.
Modes of Study	- Lectures and exercises 24 hours - Team work and a limited project work 20 hours - Presentations of the results of the team work/ project work 8 hours - Independent work, reading 26 hours Total workload 78 hours.
Evaluation	Final grade 0-5: Attendance 30% Test 30% Assignment - report on project 40%
Study Materials	Hand outs of lecture notes, internet resources in open access (given).
Prerequisites	Preferably, students of engineering major or Bachelor’s degree in non-technical studies.