

Course ID
UEC-TRIZ
Course Duration
2 days

Course Title
Innovate Using TRIZ: Contradiction Analysis

Related Courses

- TRIZ for Systematic Innovation (TRIZ3D, 3 days)
- TRIZ: Introductory Workshop with (Optional) MATRIZ Certification Testing (TRIZ1, 5 days)
- TRIZ: Advanced Workshop with (Optional) MATRIZ Certification Testing (TRIZ2, 5 days)
- TRIZ: Expert Workshop (TRIZ3, 10 days)
- Unleashing Engineering Creativity (ENG-CREATE, 2 days)
- Unleashing Engineering Creativity - Comprehensive (ENG-CREATE3, 3 days)

Aimed At

Engineers (all disciplines), designers, strategists, and others charged with creating innovative products, processes, systems, or services as well as those who work with them or manage their work.

Prerequisites

While there are no formal prerequisites, the course assumes an engineering, design/development, manufacturing, or technical background.

Course in a Nutshell

TRIZ, Russian for “inventive problem solving” (*Teoriza Rezhinija Izobretatalskih Zadach*), is a powerful innovation methodology that came to light when the USSR opened up to the West during *perestroika*. It is an empirically proven technique based on a 75-year study of over 4 million global patents.

This exciting 2-day course explores the state-of-the-art of TRIZ while emphasizing solution generation via the capture of root problems using technical and physical contradiction analyses. Structured as an intense workshop, it employs lectures, interactive discussion, case studies, and group activities to help you understand and get comfortable with the TRIZ basics. You will leave the course armed with the theoretical and practical expertise needed to tackle a variety of engineering challenges with enhanced creativity, helping you build significantly better products, processes, and systems.

Customize It!

Whatever the nature of your systems, processes, products, or services, we will customize the course to meet your specific objectives. Here are some of the ways in which we can tailor the course to help you get more out of it:

- Add “workshop days” at the end of the program (or a few weeks after) to allow participants to work together to address innovation challenges specific to your organization under the guidance of a TRIZ expert.
- Schedule post-class follow-up consultation for continuing your in-house TRIZ implementation.

Learn How To

- Work together as a team to understand and implement the TRIZ concepts and techniques.
- Use TRIZ to identify and overcome conflicting system requirements (i.e., design contradictions).
- Employ proven inventive procedures to find innovative solutions to your product and process design challenges.

Course Outline

Day 1: Introductory Concepts, TRIZ, and Technical Contradictions

- **Introduction and Course Overview.** Genrich Altshuller and his “theory of inventive problem solving”, TRIZ (*Teoriza Rezhinija Izobretatalskih Zadach*).
- **Innovation Tools and Application Roadmap.** The solution generation roadmap (moving between the real world and abstraction). Levels of invention. Ideality. The 40 inventive principles. Select principles in detail. Introduction to Trends of Engineering System Evolution (TESE). Case studies of product and system evolution.

Group activity: System advancement exercise.

- **Contradiction Identification.** The nature of the creativity challenge. Identifying inventive contradictions.

Group activity: Technical contradiction statement identification and development.

Resolving Technical Contradictions. The Contradiction Matrix. Using the Contradiction Matrix to resolve conflicting requirements. Finding the right contradiction. Assigning the contradiction’s improving and worsening parameters. Identifying the associated

inventive principles. Using inventive principles to focus on historically effective solution concepts.

Group Activity: Solving technical contradictions.

- ***Creativity Activity 1.*** System Innovation Exercise: Portable coffee maker, bicycle rack/stand, better computer mouse, clothes dryer, low flow toilet (or other participant choices). Using TRIZ, the contradiction matrix, and inventive principles to design an improved system.
- ***Creativity Activity 2.*** In-House Creativity Activity. Applications of the contradiction matrix to your organization's own innovation challenges. (Note: Participants should have a focus area or system challenge identified prior to the class.)

Day 2: Physical Contradiction Resolution

- **Physical Contradictions.** What they are; how they relate to, but are different than, technical contradictions. Higher level of abstractions. Defining physical contradictions. Physical contradiction resolution algorithm introduction (separation in space, time, condition and system level).
- **Separating Contradictory Requirements in Space.** Principles for resolving contradictory requirements in space. Application example.
- **Separating Contradictory Requirements in Time.** Principles for resolving contradictory requirements in time. Application example.
- **Separating Contradictory Requirements in Relation or upon Condition.** Principles for resolving contradictory requirements in relation or upon condition. Application example.
- **Separating Contradictory Requirements at the System Level.** Principles for resolving contradictory requirements at the system level. Application example.

Group Activity: Physical contradiction resolution creativity exercises. Testing for and solving contradictions in space, time, condition, and at system-level.

- **Creativity Activity 3.** Innovate design changes to address contradictory system requirements by use of technical and physical contradiction analyses methods.
- **Course Wrap-Up.** Course review. Questions and answers. Topics for further study. Plans for future actions. Course critique.

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