

"TRIZ Fundamentals" Summer Course

Two-Week (80 hours) Hands-on Training Course and Certification

July 8-19, 2024. University of Twente, Enschede, The Netherlands

The course is conducted in hybrid mode, online and in-person

Principal Trainer: Valeri Souchkov, M.Sc, certified TRIZ Master

Assistant Trainer: Tom Vaneker, Ph.D., Associate Professor

SYNOPSIS

A main goal of this unique intensive 80-hour hands-on course is to learn and master skills with modern TRIZ and Systematic Innovation for Technology and Engineering in order to increase creative and innovative productivity and performance of organizations and individuals. The course focuses on learning how to use the TRIZ paradigm and its techniques for solving problems arising in products and technologies and generation of new ideas and solutions.

The course provides understanding of principles and fundamentals of systematic innovative thinking and techniques of systematic innovation and puts them in practice.

The acquired skills help the course participants to resolve conflicting demands in a “win-win” way, maximize the use of resources, innovatively improve systems and processes, and invent new products and technologies. In addition to learning about philosophy, key concepts, process, techniques and tools, the participants acquire the basic practical skills of working with advanced TRIZ and Systematic Innovation techniques during the course, which help to extract root conflicts, resolve contradictions, identify and model system relationships, and apply the Trends of Technology Evolution to identify evolutionary potential of business systems and propose new innovative ideas. The course also includes xTRIZ additions to TRIZ to make problem formulation and solving processes more consistent and effective. xTRIZ is a practical framework developed by ICG T&C, which extends classical TRIZ. It has been tested at numerous real cases worldwide which have proven its effectiveness. The course contains



different examples to better understand the nature of TRIZ and its thinking methodology and make it applicable to a large variety of problems, products, and technologies.

The course introduces unique material developed by the author of the course and not available yet from any other sources apart from the parties with licenses from ICG T&C. During the course, the participants work on real-life projects.

The course is official and introduced by the Twente University as a part of educational curriculum. Since 2010, this course is open to general public.

GOALS OF THE COURSE

- Understand and learn principles and fundamentals of advanced TRIZ and Systematic Innovation.
- Learn and master skills with techniques of xTRIZ and advanced TRIZ.
- Learn how to apply the techniques to real situations concerning improvement of the existing products and technologies as well as inventing new generations of products and services.
- Acquire practical skills by working on real-life projects.

TARGET AUDIENCE

- Bachelor Industrial Engineering and Mechanical Engineering students and M.Sc students in any engineering discipline of the University of Twente.
- Students of similar disciplines of European Universities.
- Engineers and R&D professionals, innovation professionals, new product and technology development professionals, technology managers, new business development managers, technology executive officers, Six Sigma specialists, technical creativity and innovation trainers and facilitators, consultants, lecturers.

Previous experience with TRIZ is not required.

VALUE OF THE COURSE

- The course participants will become capable of solving most difficult inventive problems arising within their area of competence. Such skill brings tremendous value to a problem solver due to considerably shortened time for finding solutions and guided search towards most effective solutions.
- The course participants will be able to use the course materials and acquired skills in their own practice.
- Knowledge of TRIZ positively affects short and long-term benefits that can be obtained by the problems solvers and their organizations due to the acquired ability to quickly and systematically search for new solution ideas and develop new generations of products and services.



STRUCTURE OF THE COURSE

Each training day (except the first and last days) is split to three parts:

- Selected presentations of practical assignments performed by the participants.
- Lectures on a new subject.
- Practical assignments using the material from the lectures.

COURSEWARE

The courseware includes the course slides, the course book “Guide to TRIZ and xTRIZ Techniques” with TRIZ and xTRIZ techniques as well as various reference materials, the book “TRIZ: The Right Solution at the Right Time”. Additional books can be available. All courseware (except third-party books) will be also made available in electronic form for individual use by each participant during and after the course.

COURSE OUTLINE

- Modern view on innovation, innovation triggers and sources, evolution of products and technologies via innovation.
- TRIZ and its origins. Knowledge-based approach to innovation. Systematic Innovation.
- Place of TRIZ in a modern innovation process. TRIZ as a theory for innovation front-end and as a collection of tools and techniques to support correct problems formulation and new ideas generation in a systematic way.
- Understanding systematic product and process evolution via innovative problems discovery and solving. Development of products and technologies towards the highest degree of Ideality.
- Psychological inertia and its role in the development of innovative thinking skills. Fighting psychological inertia.
- Introduction to contradiction-driven technology evolution and problem formulation.
- Definition of an Inventive Problem. A process of solving inventive problems.
- Roadmap to the basic and advanced TRIZ techniques.
- Ideal Final Result and Ideal Solutions techniques.
- Innovation Situation Questionnaire table.
- **Root Conflict Analysis (RCA+)** technique for problem analysis by contradictions identification, mapping and ranking.
- *Practice with Root Conflict Analysis (RCA+) on real-life inventive problems.*
- **Contradiction Matrix** and **40 Inventive Principles** techniques for systematic contradiction elimination.
- *Practice with Contradiction Matrix and 40 Inventive Principle on real-life inventive problems on real-life inventive problems.*
- **TRIZ-based Function Analysis** technique to model functional interactions within a product or a process to discover a full set of problems and challenges which can be used for innovative improvement of a selected product or technology.
- *Practice with TRIZ-based Function Analysis of products.*
- **Trimming technique:** increasing benefits/costs ratio of products and processes.
- *Practice with TRIZ-based Trimming Technique.*
- **TRIZ Catalogues of Scientific Effects.** Function-based of scientific effects to create and develop disruptive innovations.
- **Substance-Field Modeling** to build abstract models of problems.
- **System of 76 Inventive Standards:** a structured collection of practical techniques on eliminating negative and improving positive effects within products and processes.
- *Practice with Substance-Field Modeling and 76 Inventive Standards.*
- Models of systematic products and technology development. Analysis of innovative potential of technical systems.
- **Feature Transfer:** A technique to create breakthrough innovations by transferring alternative systems features.
- **TRIZ Trends of Products and Technology Evolution** and specific patterns of evolution with examples.
- *Practice with the TRIZ Trends of Evolution of Products and Technologies.*
- Introduction to **ARIZ (Algorithm of Solving Inventive Problems)**: logic of ARIZ-85C, explanation of major concepts, structure, and working principles, resolving physical contradictions, fighting mental inertia. Problem solving process with ARIZ on the basis of specific example.
- **Ideas evaluation, selection, and landscaping.**
- Overview of additional tools of TRIZ and xTRIZ: Anticipatory Failures Analysis, Super-Effect Analysis, Multi-Screen Analysis, Creative Imagination Development, TRIZ Implementation aspects.

CERTIFICATION

Upon successful completion of the course, each participant will be awarded with the “TRIZ Practitioner (Advanced Level)” certificates issued by the University of Twente in affiliation with The TRIZ Training International Centre. B.Sc. and M.Sc. EU students successfully completing the course will also obtain 3 European Credits. In addition, participant will receive a certificate of the International TRIZ Official Association (MATRIZ Official) Level 2.

PRINCIPAL TRAINER



Valeri V. Souchkov, M.Sc., Certified TRIZ Master, is internationally acknowledged innovation and TRIZ expert, developer and trainer certified by G. Altshuller (the founder of TRIZ). He pioneered professional TRIZ activities in Western Europe and USA and has experience with delivery of TRIZ and Systematic Innovation services worldwide since 1989. He trained and assisted professionals of more than 750 customer organizations including Capgemini, DSM, DuPont, ING, LG Group, Orange, Reckitt Benckiser, Philips, Posco, Sekisui, Shell, Siemens, Thales, TNO, TNT Post, Vredestein, Unilever, Watson Marlow; as well as universities and government agencies. In total, he trained more than 7.000 professionals in TRIZ and Systematic Innovation. Valeri also a lecturer of TRIZ courses at

the University of Twente in Enschede, visiting faculty member of TiasNimbas Business School in Tilburg, and invited lecturer on TRIZ of several other universities worldwide. In 2000 he originated and co-founded the European TRIZ Association (ETRIA). Currently he is Vice President and Board Member of the International TRIZ Association (MATRIZ). Valeri is editor of the Proceedings of TRIZfest International Conference, author and co-author of 6 books and more than 100 publications including journals and conference proceedings.

GENERAL

- Training will be conducted at the University of Twente campus, "Horst" building, in Enschede, The Netherlands.
- The course will run on business days. The weekend (Saturday-Sunday) is free.
- A training day lasts at least 8 academic hours including lunch and breaks. Usually the training day starts at 09:00 and finishes around 17:30, with a lunch break from 12:30 to 13:45.
- The first half of a day (lectures) are delivered in online mode from 09:00 to 12:00, therefore presence in the classroom is not necessary.
- The second half of each day (except the first and the last days) will be spent in the classroom by doing practical assignments in groups.
- During the course, the participants learn by working on their own projects. It is desired that the participants bring their own problem(s) to the course provided the information can be disclosed publicly.

LANGUAGE

The course is conducted in English.

FEES, TERMS AND CONDITIONS

- For full-time B.Sc. and M.Sc. students from the European Union participation is free.
- For a non-student participation, the full course fee per seat for the 80-hour (3 European Credits) course is EUR 3200 (excluding 21% Dutch Value-Added Tax). This fee applies only to those participants who do not have an official student status within the European Union.
- 21% Value-Added Tax (VAT) should be paid by organizations located in the Netherlands as well as EU organizations which do not have registered VAT number, and all non-business organizations independently of residence. Paid VAT can be later reclaimed in full from the Netherlands Tax Authorities by residents located outside the European Union.
- 30% discount is available for full-time staff members of non-profit educational or academic organizations and full-time international students.
- Payment should be done on the basis of the invoice sent to a registered participant by ICG T&C after registration. Term of payment is two weeks from the date of the invoice.
- Officially registered students of the European Universities should contact us as soon as possible for financial details.
- Price covers: full participation in the course, the course materials and handouts, as well as 3 months after-course "Questions and Answers" support, certificate.
- Accommodation and travel expenses are not included to the course fee and are arranged by each participant independently. There is a selection of B&B places and hotels close to the campus. Prices range from EUR 60 (B&B) to EUR 80-150 (hotels) per night. Please contact us for further details.
- Full payment of the course fee prior to the starting course date is obligatory.
- Payment of the course fee by non-student participants will be based on an invoice issued by ICG T&C upon registration. Payment term is two weeks since the date of the invoice.
- Note that a total number of participants as well as percentage of non-student participation is limited. Therefore we advice you to make your definite reservation as early as possible.

CANCELLATION

- If participation in the course is cancelled by a customer one months before the course starting date, ICG T&C provides 100% refund a total amount of fee(s) paid by a customer. Otherwise ICG T&C retains 20% of the paid fee.
- If the course is cancelled by ICG T&C or the University of Twente, ICG T&C guarantees full refund of a total amount of fee(s) paid by a customer within two weeks after cancellation announcement unless it is explicitly agreed otherwise with a customer.

MAINTENANCE AND SUPPORT

- The course fee includes 3 months of free "Questions and Answers" support by ICG T&C by phone, fax, or e-mail.
- During the first 6 months after the last day of the course, ICG T&C expert might be available to the customer's organization for additional training, consulting, or coaching for total up to 5 days with 20% discount of standard ICG T&C rates.

FOLLOW-UP SERVICES

For student participants an extension of the course (52 hours) is possible by performing one of three projects:

- Developing a practical case study
- Performing TRIZ research
- Participation in the engineering design contests.

For non-student participants, the follow-up services might include:

- Further training in TRIZ.
- Training of different groups and teams within a customer organization.
- After-training individual and group coaching.
- Assistance with Innovative Projects, facilitation of working sessions.
- Assistance with corporate-wide TRIZ and Systematic Innovation implementation.

FURTHER USE AND APPROPRIATE LICENSING

The course content learned, and the courseware obtained during this course might be used by the customer organization and the course participants without limitation both internally as well as externally in their any work activities which are not related to training on subjects of TRIZ, xTRIZ and Systematic Innovation. However, to use the course content (except which is in a public domain) and courseware for independent training activities (both internal and external), a relevant accreditation and license(s) should be requested from ICG T&C.

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REGISTRATION

A link to registration is located at: <http://www.xtriz.com/summercourse.htm>

CONTACT AND FURTHER INFORMATION

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The University of Twente is a fully accredited international entrepreneurial research university with 3.500 scientific and educational staff and over 11.000 students of more than 70 nationalities. It is located in Enschede, The Netherlands.

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