

# Systematic Inventive Thinking

## Course Summary

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The ability to solve problems creatively and generate change is a recognized standard of success and plays an important role in gaining a competitive advantage in many areas of business management. Despite the enormous effects of creative ideas in management, this is one component in managers' work, which traditionally defies quantitative evaluation or the applications of systematic approaches.

### Learning Outcomes

Not only is the original idea itself difficult to evaluate precisely, the ability to generate such ideas is generally considered an inherent personality trait that cannot be acquired: Creative people, it is generally believed, are born, not made. The conventional approach is, therefore, to view creative managers as a different class of individuals. Although creative individuals may have some degree of difficulty working on routine. According to this approach, the stroke of genius or inspiration may occur once in ten years, yet the organization will benefit by waiting patiently to reap the fruits of its creative managers. Supported by recent studies, this course reflects a completely different approach to creativity, and is grounded in the assumption that creative thinking is not different from other cognitive processes used in the best professional reasoning. Creative thought processes simply differ in the distinct orientation they establish to problem definition: Creative problem solving directs the solver to search in areas that are potentially richer in creative solutions. Creativity, then, is a skill, not a trait, which can be acquired and improved by practice; it can be part of the manager's toolbox, and it can be applied on demand. This course presents a new paradigm and provides students with systematic tools for creative ideation.

### Assessment Overview

### Teaching Methods

### Teaching/Contact Hours

### Suggested Independent Study Hours

### Course Preparation and Reading

### Course Structure

### Streams

There are no specific requirements for the background except interest in innovation and willingness to think and explore new paths that are separate from routine traditional ones.

## Learning Outcomes

On successful completion of this course, students will be able to:

- Significantly increase the probability of spotting opportunities that belong to the space of creative solutions to problems.
- Analyse problems in a way that leads to different set of (traditional) solutions.
- Understanding the mechanisms of resistance to innovation (both inside the organization and in the marketplace) and how to address them.
- Develop the ability to work within constraints yet aiming at revolutionizing the systems at hand.

## Assessment Overview

One individual assignment (40%)  
One group assignment, teams of four (50%).  
Class participation: based on class performance (10%)

Assessment arrangements are indicative only and subject to change but will be confirmed when the course syllabus is published to the class

## Teaching Methods

The course is based on a blend of methods:

- 1) The usual style of lectures in class is still a large component.
- 2) Applying in class a cloud-based platform to facilitate ideation
- 3) One guest speaker who is going to share his experience with applying this approach in real cases.
- 4) One course challenge in which students will solve a real problem for a firm by interacting with its managers.
- 5) Depending on availability of the equipment one VR session to train the students in constraints management.
- 6) Few of short videos to watch between classes.

## Teaching/Contact Hours

27.5 hours across 10 sessions

## Suggested Independent Study Hours

1-2 hours for studying course readings across the course  
1-2 hours for completion of the written assignment across the course  
4 hours for the group project spread across the course

## Course Preparation and Reading

none

## Course Structure

The hostile environment:

Resistance to innovation mechanism: Review of the challenges a creative idea has to face.  
A presentation of the course challenge by guests from industry

# Systematic Inventive Thinking

Defining creative solutions. The traits of creative ideas. Conventional approaches to the study of creativity. The trap of modern marketing and the illusion of “listening to the voice of the customer” when searching for a creative idea.

The Multiplication Template:

How to manipulate components inside the box. The concept of novel combination of existing components.

“It Is Not A Bug – It Is A Feature”: The Function Follows Form (FFF) Principle:

Introducing and practicing with the Function Follows Form principle. The reversed causality of the problem solving main paradigm.

The Attribute Dependency Template:

Creating a connection between inherently independent variables. Increasing dimensionality.

The Forecasting Matrix and the Omnivati Software:

Managing the search of attribute dependency through a forecasting matrix: Navigation in the multidimensional space of system variables. In this class the students will; practice the work using a software.

The Closed World Principle:

The Closed World Principle defines a hidden space with high density of creative ideas. Using existing resources to generate new value.

When Less Becomes More - the Subtraction Template:

The less the merrier: Improving product functionality by reduction and elimination. Two templates that offer complementary spaces of ideas – subtraction with replacement and subtraction “as is”.

The Contradiction Principle and the Necessary Conditions line of thought:

Thinking through necessary conditions vs. sufficient conditions. Defining a contradiction. Using a contradiction to chart ideas hidden by certain type of fixedness. The contradiction was the first discovery in the systematic creativity research (around 1940), and it is still the most fascinating one.

Presentations, a session of second order problems:

Presentation of ideas to the challenge that was presented in the first class. Feedback from the guests. Defining the second order problems. Presenting a self-training method to continue an independent journey in the systematic creativity space.

Streams

E624 SUM25

SUM25

[Jacob Goldenberg](#)

Block Week