COR 100: Creative Thinker's Toolkit: Thinking and Acting
(General Education Program Foundation Cluster)

Wiki: http://creativethinkerstoolkit.pbworks.com/w/page/23012682/FrontPage

Fall, /Spring,

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1. Course: COR 100, Creative Thinker's Toolkit:: Thinking and Acting, 3 Cr. 3 Hr.

2. Textbook (initial): Theory of Constraints and Thinking Processes in Academia – Umesh Nagarkatte and Nancy Oley

3. Objectives: This course serves as "Thinking Across Curriculum." The course empowers students to think effectively, solve problems, make responsible decisions and reach their academic and personal goals.

The course has been developed to bring students in contact with the academic faculty of their chosen major in their freshman year or as early as possible in their academic career. This is an interdisciplinary course taught by various instructors in students' chosen major – Science/Mathematics, Business, Social and Behavioral Sciences, Liberal Arts/Undecided. The students will know about the discipline/s, faculty, resources, graduate study and career options in the area/s of their choice.

Learning Competencies:

Students will be able to:

1. Solve complex problems
2. Resolve conflicts at home and at work: Work out daily conflicts
3. Articulate personal, academic and vocational goals
4. Learn virtually anything
5. Think creatively
6. Make win/win decisions
7. "Read between the lines" and "connect the dots"
8. Manage their time
9. Approach tasks confidently

10. Clarify values
11. Identify wants and needs
12. Think about consequences
13. Communicate effectively
14. Argue persuasively

Topics/Content Areas:

- Conceptualization: how to state and shape a problem
- Problem solving: hypotheses, algorithms, heuristics
- Creativity: brainstorming with convergent/divergent thinking
- Decision-making
- Argumentation and evidence
- Argument mapping and reconstruction
- Making logical inferences: normative patterns for deduction and induction
- Basic research methods

4. Learning Activities

- Developing a plan
- Articulating obstacles
- Visualizing and graphically rendering problems/issues
- Collaborating on team-based community projects (students of a particular major will be divided in several groups of 4 or 5 students for semester-long collaborative work.
- Writing intensively – using journals, blogs, and wikis to develop storylines, surface assumptions, summarize topics and describe ongoing projects. Students will develop an e-portfolio that contains their autobiography, social-network, writing projects, and reflections.
- Faculty workshops several times each semester to share findings and discuss instructional issues. Examples will be provided from appropriate disciplines that use the above tools.
- As assessment, the student will prepare several small and large Powerpoint projects and 50 examples to resolve their own daily conflicts during the semester, and a final project plan for their career as a final exam of the course. In addition, the faculty in various disciplines will assign other projects in their disciplines.

5. Instructor/s: Various from different Disciplines

Office: , Telephone: , Hours: and appointment.

Email: @mec.cuny.edu

6. Prerequisites – None

7. Software: Students will use Microsoft Word, Powerpoint and TLT software to construct various diagrams involved in the course. No previous knowledge of software is assumed. Students will get a copy of TLT for their use.

8. Resources: Resources:

Faculty: In addition to the instructor being the important resource, students will work concurrently with other academic instructors of the course. All faculty will first receive workshop from Drs. Nancy Oley of Department of Psychology and Umesh Nagarkatte of Department of Mathematics assisted by Dr. Michael Fitzgerald of Department of Philosophy in addition to their professional expertise.

Students: Fellow students are another important resource. Studying with two or three students together, discussing the ideas with them on a regular basis twice a week helps motivate, study and improve performance. Students are expected to attend all classes. Any absences from the class form a gap in the understanding, since there is no substitute for first hand knowledge obtained in the interaction with the class instructor and fellow students.

Other resources:

Reading Materials:

- Lahey, B.B. (2009). Psychology: an Introduction, 10th ed. NY: McGraw Hill. Selected chapters. Any introductory psychology textbook of the appropriate reading level could be used.
- Vaughn, Lewis (2010). The Power of Critical Thinking, 3rd ed. NY: Oxford University Press. An introductory text that guides students through the basics of reasoning, argumentation, and explanation.
- The authors have developed a Motivational Guide introducing various effective tools and strategies for students' understanding life and achieving success in personal and academic life, various course and time management.

There are additional help materials on the following websites:

- www.autosocratic.com,
- www.TOCforEducation.com

Other useful TOC websites will be notified as the instructor becomes aware of them.

9. Strategies for the Learning Outcomes

1. Faculty in various disciplines teaching the course will communicate with each other frequently and meet formally prior to teaching the course and every four weeks during the semester. They will also work with counselors of SASS as the need arises, but formally before the course starts.

a. 2. Students will work with the Chairs of the Departments of their intended areas of specialization. A group of four to five students from a section of the Creative Thinker's Toolkit course visit a department of their choice. The Chair of the Department should already been notified of this visit by the instructor of the section. The Chair gives the students a brief idea of the discipline – a brochure of the department, courses in the discipline, support system that is available in terms of tutors, online help, faculty available for future contacts, applications to real life, career choices, graduate studies in the discipline, etc.
b. The students then individually or as a group attend a class or two in the discipline, talk informally to some of the students of the class.
c. The group then prepares a report/presentation on their reflections and presents it to the entire section.
d. The group receives a grade as one of the projects from the instructor.

The students perform this activity as a project outside of class time. This exercise could be repeated several times during the semester.

3. Use all available resources. Each class will be equipped with a smart cart.

4. Topics will be presented with concepts and algorithms in a logical fashion informally and formally using examples from various sources such as newspapers, websites. The course schedule is attached at the end of the document.

5. Confidence will be instilled in students by their active participation in instruction in order to accomplish consistent individual and group work that will lead to success.

6. Students will prepare a (word processed) summary in their own words from each section using the examples from their discipline in a structured format: Goal of the sections, concept or concepts covered in the section each with example/s linking them in a logical order. This will help them with practice in writing, reflection, to review for tests and will form a portfolio of the course at the end of the semester. Students will develop an e-portfolio that contains their autobiography, social-network, above writing projects, and reflections.

7. Students will be assigned homework to turn in and receive feedback within a week.

8. Students will complete several projects and the instructor will select some for class presentation.

9. Instructors will always available through office hours and also by appointment and by e-mail.

10. Assessment Methodology

The grade will be determined as follows:

1. Assignments: All assignments must be completed and handed in by the date announced. The deadlines for turning in the projects are assigned in the syllabus. **Students who do not hand in all their assignments will not receive a passing grade.**

2. The summaries of each chapter will constitute 25% of the course grade.

3. Exams: Student presentations and various trees developed by the student -

   50 Conflict Resolution Clouds (25%), Ambitious Target Tree to attain student's academic goal (25%) Collaborative Community Project (25%)

11. Expected Results

1. The strategies will guarantee that students perform A or B grade level work.

2. Students will be able to use computers and use software to do their homework.

3. Students will learn how to apply the concepts and skills of the course to practical applications.

4. Students will develop communication skills.

5. With the cooperation of students it is expected that 100% students will pass the course.

6. Most students will develop an ability to handle systematically credit courses in their disciplines.

7. Students will have a 'big picture' of the area they want to graduate in. They will know about the department, discipline, resources, graduate study, career options, etc,

12. Previous Experience for this Course

The authors of the initial textbook have undergone formal training in Thinking Process Skills at the Avraham Goldratt Institute (AGI) in New Haven, CT. They have used these techniques for the last several years, have helped to facilitate or facilitated fellow faculty members, students and tutors in learning and implementing the skills, and have made presentations in local and international conferences on their research involving student and faculty issues. Assisting faculty, Dr. Fitzgerald, has studied the subject informally for the last two years.

The authors have developed a Motivational Guide introducing various effective tools and strategies for students' understanding life and achieving success in personal and academic life, various course and time management.

Detailed syllabus next page.

13. Syllabus for Creative Thinker's Toolkit

Detailed Syllabus for:

COR 100 - Creative Thinker's Toolkit: Thinking and Acting

Fall /Spring

14 weeks, 27-28 meetings, 1.5 class hrs./meeting

Italicized **phrases list 15 Learning Competencies.**

Lecture Day		Topic	Chapter/Section
1		What are thinking processes? Logic underlying – Logic twigs.	1
		Making groups of students in the class for collaborative work.	1
		Discussion of Examples of logic – from Academic Disciplines	
2		***Argumentation and Evidence*** - Graphical method of resolving conflicts - Evaporating Cloud – creating a simple personal cloud; ***Identify wants and needs***,	2 – 1,2 slides 2-6,
		Clarify values; Identify and resolve day-to-day conflicts, Multitasking game Numbers Game – Finding order in chaos	slides # 7,8
		Examples from Academic disciplines – Academic Class project – List of UDEs	
	Assignments due	**8 personal clouds, Chapter 1 summary**	
3		Addressing Chronic Conflicts; ***Resolve conflicts at home and at work:*** Working out daily conflicts	2 – 3
		Examples in Disciplines - Writing about your experiences in mathematics/disciplines – Listing UDEs and making clouds from 3 chosen UDEs	
4		**Approach tasks confidently;** Empowerment Clouds Examples from Academic Discipline	2 – 4
5		3-Cloud Process, summary of clouds	2 – 5
6		Making the CORE Conflict Cloud and surfacing assumptions, suggesting injections. ***Construct persuasive arguments;*** Examples from Academic Discipline	
	Assignments due	**10 personal clouds, Chapter 2 summary, academic project Core Conflict Cloud**	
7		***Communicating effectively; how to debate;*** Student	

		individual/group Presentations on core conflicts;	
8		***Argument mapping and logical connections*** - The Branch - Checking 'if ..then' logic Examples of the Branch from Academic Discipline	3 – 1
9		***Learning how to read between the lines; Reaching Decisions***	3 – 2
10		Examples from Academic Disciplines Negative Branch Reservations and Positive Branches	3 – 3
11		***Solve complex problems;*** Examples from Academic Disciplines	
12		Half-Baked Solutions; ***Think about consequences*** Examples from Academic Disciplines	3 – 4
	Assignments due	**18 personal clouds, Chapter 3-1 thru 6 summary, academic project Current Reality Tree**	
13		***Inferential patterns: deduction and induction*** - Current Reality Tree (CRT) Discussion of Students' Academic CRTs	3 – 5, 6
14		Student individual/group Presentations on CRTs Student individual/group Presentations on CRTs	
15		Future Reality Tree	3 – 7, 8
16		Student's Academic Future Reality Tree Examples from Academic Disciplines	
17		***"Connecting the dots"***, Transition Tree	3 – 9
18		Solving a System of Equations – Science, Business Example	
	Assignment due	**6 personal clouds, Chapter 3 summary, academic project list of DEs and Future Reality Tree**	
19		Ambitious Target Tree (ATT) Examples from Academic Disciplines	4 -1, 2
20		***Envision their goals;*** Students prepare their ATTs	4 – 3, 7
21		Examples to solve problems in Academic Disciplines using ATTs	4 – 8
22		***Time management;*** How to develop a project plan and use Transition Tree to bring it into action.	4-9
	Assignment due	**6 personal clouds, Chapter 4 summary**	
23		***Become more creative thinkers;*** Student individual/group Presentations on ATTs	
24		Student individual/group Presentations on ATTs	
25		Job shop game	
26		Summary of Thinking Processes	4-11
27		***Learn virtually anything;*** Examples in Academic Disciplines	

==== Final Project ====

Examples from Academic Disciplines – Four Examples
Creative Thinker's Toolkit
Sample Examples from Business
Sambhavi Lakshminarayanan
Department of Business Administration

a. Conflict: These situations arise in everyday workplace situations and do not need special knowledge for discussion. They can be discussed again in MAN 314 (Organizational Behavior) and framed in the context of discussions on workplace diversity, motivation and conflict resolution.
    1. Between employees in workplace: example in restaurant – should tips be pooled or not?
    2. Manager and team members – scheduling work assignment when some employees are parents and others are not; should parent employees be entitled to special treatment?

b. Empowerment: This topic is discussed in MAN 200 (Introduction to Management and Business) in the context of managerial jobs and delegation. At that point the discussion also includes the advantages of delegation and why managers are often reluctant to delegate and the advantages of empowerment (motivation of employees)
    1. Employees not familiar with task assignment - how to should the manager ensure that the employee feels confident to learn skills and complete the task.

c. Construct persuasive arguments:
    1. Pitching a business idea – why a bank officer or an investor should support a new business. Reasons should be based on date and argument for it is objective.
    2. Choice of strategy for business – adding new products.

d. Decision making – take on a new partner, hiring employees
e. Complex problems – This issue is discussed briefly in MAN 200 (Introduction to Management) and in more detail in MAN 316 (Human Resource Management)
    1. Performance appraisal and decision whether to terminate an employee or not. Should personal reasons play a role or should it be only performance oriented ? What are ethics and possible conflicts of interest?
f. Solve systems of equations –This topic is discussed in detail in MAN 416 (Management Science) in Linear programming
    1. Product Mix – how many units of each product to make given resource limitations. A classic starter example is – "how many tables and chairs should a furniture manufacturer make, given labor hour requirements and availability and raw material requirements and availability?"

Creative Thinker's Toolkit
Sample Examples from the Philosophy Program
Michael FitzGerald
Department of Philosophy and Religion

a. Conflict Resolution: Seemingly intractable ethical conflicts arise regularly in the course of human interaction, yet they must be resolved. Here are several examples that might be discussed in the course:

    1. Does an unemployed man with a family have a right to steal food to feed his children?
    2. Must a lawyer who is a public defender represent a terrorist?
    3. Should a politician support legislation that she knows to be flawed if it benefits her constituency but inflicts hardship on other citizens?

b. Empowerment: Students who use the reasoning skills in the Toolkit are able to analyze conflicts (such as the above) and arrive at solutions that optimize benefits and minimize undesirable effects. As they practice the skills, students develop proficiency and gain self-confidence.

c. Construct persuasive arguments: Students in the course will understand the relationship between evidentiary statements (premises) and evaluative recommendations (conclusions) in the framework of argumentation. They will use argument maps to diagram and visually display inferential relationships. Further, they will reconstruct arguments taken from media sources and editorial pages, identifying premises/conclusions and characterizing the justification strategies that the argument employs. For example, a typical classroom exercise in a philosophy class will require students to reconstruct and critique Op-Ed columns on topical and controversial issues.

d. Decision making: As a consequence of using the Toolkit, students will be better equipped to arrive at sound courses of action in both their personal and professional lives, and immediately in their academic careers.

e. Complex problems: Most problems that humans encounter are not single-solution issues. The Toolkit shows students how to identify the opposing constraints and assumptions that lead to undesirable effects, to specify core conflicts, and to address the conflicts through feasible and effective action. For example, in a philosophical discussion of retributive justice, what are the assumptions that underlie a belief in capital punishment? What are the possible undesirable effects? Is there a core conflict between the desire for revenge and the need to equitably apply the law? What is the most reasonable course of action necessary to ensure justice?

Creative Thinker's Toolkit
Sample examples from the Psychology Program

Nancy Oley
Department of Psychology

a. Logic:
To truly understand behavior in the scientific sense, psychologists strive to understand all the necessary and sufficient causes of that behavior. Students learn the difference between necessary and sufficient causes (or necessity condition and sufficient condition logic), e.g., Does abuse in childhood cause aggression in adulthood (sufficient by itself), or is it just one of many factors which together with abuse are required (necessary) to cause aggression in adults? This will provide the foundation for discussing the experimental method in detail.

Using the Toolkit, students create their own short logic branches to illustrate the two types of logic as it applies to their own behavior, e.g., if I yell at my child, then she will cry; if she cries, then I will have to stop what I am doing and deal with her; if I deal with her, then I won't get my own work done, etc…. ; or, in order to get along with my boss, I must first act in a friendly manner toward him; in order to act in a friendly manner toward him, I must respect him, etc.

b. Conflict resolution:
Psychologists sometimes find themselves faced with ethical dilemmas, e.g., I want to study depression in monkey babies in order to help children, but to do so, I have to remove them from their mothers for several weeks. This would interfere with their normal emotional development. What should I do? Using the Toolkit, students will learn how to discover the underlying assumptions in this situation and to come up with creative, win-win solutions to resolve it.

c. Empowerment:
Psychologists study human development, from birth to death. Maturation is a slow process, characterized by increasing levels of physical, cognitive and emotional competence. Students will be led to reflect on their own functioning as they master the cognitive strategies of the Toolkit, tools that enable them to plan better, make better decisions and resolve their own conflicts.

d. Decision Making:
Students will learn about the Bystander effect through the famous case of Kitty Genovese, murdered while many of her neighbors watched. No one helped. Using the Toolkit, they will discover for themselves what social psychologists now know —what obstacles stand in the way of helping, what intermediate objectives are needed to overcome the obstacles, and what order they have to be in to lead someone to decide to help ("the decision tree").

e. Problem Solving:
The field of cognitive psychology deals in part with how we solve problems. Students will learn about creativity, convergent and divergent thinking, heuristics, algorithms, as well as inductive and deductive reasoning. They will learn to identify the constraints in a problem situation, the assumptions that are implicit in it, and the conflicts that block the solution. Using the Toolkit, they will identify possible solutions and their probable positive and negative consequences.

Creative Thinker's Toolkit
Sample Examples from Natural Science and Mathematics
Umesh Nagarkatte
Department of Mathematics

a. Problem Solving: The main goal in Mathematics is to solve problems of either logical non-numerical-deductive or inductive, or numerical nature: Whatever the nature the problem, it has a set of assumptions and a conclusion or a set of conclusions. Starting with the set of assumptions and a set of known facts one must logically come to a conclusion. The deductive method discussed in Chapter 2 "What to change?" using "if…then logic" generalizing from the common patterns in specific examples in the course, the student is trained to develop a logical chain of statements from assumptions to the conclusion/s.

Solving Word Problems - A mathematical word problem is usually well-defined and involves necessary and sufficient conditions. The steps to solve a word problem are as follows and depend on "if…then" logic, in other words based on assumptions or given information.

1. Read the problem, verbalize it in your words to comprehend what is given and what is asked, labeling the unknowns in letters (variables) if they exist.
2. Translate the given information into a mathematical equation or inequality using given.
3. Check the examples 4.6.2 using the "Transition Tree" tool to solve the equation so that there is no logical gap in the solution.
4. Once you solve the equation, translate back the values of variables in terms of the values of the quantities.

Thus a problem is solved going one step at a time from 'what is known' (given) to 'what is unknown'. An example of how to solve a problem involving a system of equations is discussed in the course that uses a thinking tool called a transition tree.

b. **Empowerment:** This topic is discussed in Chapter 2 of the text book of the course.
A student who feels that s/he is not capable of doing mathematics, but needs to take some mathematics courses can be empowered by challenging the student's negative assumptions and providing the payoff of learning and a conducive learning environment that exists in the Department of Mathematics.

c. Construct persuasive arguments:

1. Why should a student select a certain STEM career? – The choice of careers depends upon talents the student possesses and the mentors, undergraduate research opportunities, internships, and role models available for motivation and pursuit. The student should be able to write a persuasive objective essay as a result of the training in the course

2. Choice of strategy – Taking a curriculum and course track as a long project and a course as a semester long project, apply techniques of how to devise a plan and finish the project at hand satisfactorily on time using resources (help of the support team) available for the course.

d. **Decision making** – 1. How to balance a course load with science/business and liberal arts courses. 2. Whether an opportunity to make money while taking courses hinders or promotes progress to the goal. Check with a logical chain of arguments the pros and cons.

Complex problems – How to prove a theorem? This is discussed in **MTH 206 Introduction to Proof.** Most mathematics concepts are comprehended and transferable to applied topics once the logical connection between the related concepts instead of remembering isolated formulas. This is an application of item a. The logical connections of concepts with real life situations make the concepts interesting and devoid of such connections make mathematics sterile.