



DeVry Institute of Technology  
Midtown  
Logic, Critical Thinking and Problem Solving  
COLL 147 Section N  
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Class meetings: Thursday evenings  
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**The instructor:** [Dr Ron Milon](#) is the Dean of the Business Department at DeVry Institute of Technology in Long island City, New York. He received his B.S. degree in History and Political Science from SUNY College at Brockport (1987), his first M.A. degree in History from the University of Buffalo (1989), his second M.A. degree in Political Science from the New School University (1995) and his third masters (MAIA) in International Affairs from the New School University (1995). From 1989 – 1992 Mr. Milon was a Ralph Bunche Fellow on the United Nations. Dr. Milon received his Ph.D. in Adult Education and post secondary education from [Capella University](#) in 2006.

**Required Course Materials:**

1. Feldman, R. S. (2006). [Power Learning: Strategies and success in college and life](#).  
(DeVry bookstore at Long Island City)

2. Folio Live (Electronic portfolio tool)
3. The Christian Science Monitor (a daily newspaper mailed to your address. You will need to sign up for it at the first day of class. It is **NOT** a Christian or otherwise religious paper).

**DO NOT PURCHASE:** *The Learning Commitment: Strategies for Solving the Problems That Matter.* Oak Brook Terrace, IL: DeVry Educational Development Corporation, 2006.

**Credit hours:** 3

**Class Description:** This course provides instruction and practice in the areas of critical thinking, problem solving, and use of research as a problem-solving tool. Course objectives are addressed through problem solving methodologies, critical analysis of information, cooperative learning, and research strategies. This course will also assist students in identifying and articulating the skills necessary to be successful academically and professionally. Ethical and values considerations are included within the critical thinking and problem solving framework.

The course helps students master the fundamentals of effective problem solving and and apply them to a range of practical problems. Major areas of subject matter and activity include problem solving methodologies, research strategies, logical reasoning, critical analysis of information, and cooperative learning.

I. **Course Strategy:**

Thinking critically and applying logical frameworks involves consciously observing, analyzing, synthesizing, evaluating, and problem solving according to well-tested standards. In this course, the basic knowledge needed for critical thinking is introduced. The results of this process are further evaluated according to standards for clarity, accuracy, relevance, reliability, and fairness. Thinking skills are then exercised through observation, analysis, and problem solving.

This course also examines and amplifies the logical and critical thinking skills learned formally and informally throughout the curriculum, allowing the student to think critically about the decisions and accomplishments of the past, prepare for entrance into the workplace, and formulate and revise personal and professional decisions. The basics of critical thinking and the problems associated with critical thinking are explored. These skills and abilities become an asset to the student and the project groups to which each student is assigned in upper-level and capstone courses.

**II. Rationale:**

The call from business, industry, and government is for employees who can evaluate current situations and creatively respond with new ideas and options. DeVry's program advisory boards continually recommends the need for communication, logic, and problem solving skills for its graduates. These abilities are requisite for entry into a profession and become increasingly important for advancement within the organization. As a result, the development of these skills is an integral part a student's academic career leading to success in the chosen profession.

Given the technological and informational revolution, there are ever increasing amounts of information available in most areas of industry and business. Through this course, the student develops strategies to evaluate the sources and appropriateness of the information, develops creative alternative solutions, and chooses, implements, and evaluates alternatives. The inclusion of a collaborative report and presentation prepares students for work in teams.

Given the needs of business and industry, and of society as a whole, the skills associated with logic and critical thinking are essential. Logic and critical thinking are subjects that go well together and are generally and easily grouped together in an introductory class. The skills of logical and critical thinking are conducive to a student's ability to learn, change, and adapt to new and challenging situations.

**III. Course Objectives:**

- 1 Given a problem situation or a case study in a business or technical environment, analyze its components to define the problem and identify possible causes.
- 2 Given a situation or a case study with a clearly defined problem, research and evaluate appropriate strategies to generate possible solutions.

- 3 Given a clearly defined problem situation or case study with potential solutions, use valid research, team consensus, and analysis strategies to select the most appropriate action to be taken.
- 4 Given a specific solution to a particular problem, develop an effective implementation plan for the solution, including project management techniques such as Gantt charts or flowcharts.
- 5 Given an inference stated in natural language, analyze the argument to determine whether it contains any of the common logical fallacies.
- 6 Given a problem situation or case study requiring a multiple-step solution, explain the use of visual representation to illustrate the logic of the solution.
- 7 Given a problem situation or case study involving an issue such as affirmative action or sexual harassment, apply the principles of argument and ethical decision making to identify the issues and formulate an opinion.
- 8 Given a problem situation or case study involving cultural differences, use the principles of value assumptions to analyze how conflicting values can bring about differing conclusions.
- 9 Given a problem situation to be solved by a team, research, develop, and apply team guidelines addressing issues such as conflict resolution and effective communication.
- 10 Given a need for information in order to solve a problem, apply the appropriate research strategies for retrieval of information and evaluate those resources using clearly defined research criteria.
- 11 Given status as a new college student, develop an individual self-assessment about skills, behaviors, and attitudes as they relate to one's academic and professional plans and goals.
- 12 Given a listing of productive behaviors important to academic success, create an individual plan that maximizes strengths and abilities and identifies specific interim goals necessary to achieve one's long-term academic goals.
- 13 Given a problem situation or case study, participate as a member of a student team that applies the principles of problem solving, logical analysis, teamwork, and effective research to formulate a solution and present the solution in a written and oral format of professional caliber.

IV. **Class Expectations and Grading:**

The following will be required of you while taking this class:

A.	Midterm	100 points
B.	News journal	100 points
C.	Team assignments and class activities	100 points
D.	eCollege	100 points (10 points a week)
E.	College life activities	100 points
F.	Final examination	200 points

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700 points

**Grade Scale**

<u>Letter Grade</u>	<u>Numerical Equivalent</u>
A	90-100
B	80-89
C	70-79
D	60-69
F	Below 60
I	Incomplete

A) Midterm: The midterm will be an essay exam consisting of 5 (Five) identification and three short essay questions. Choices will be offered to the student on each exam. Prior to the test I recommend that you keep good notes on the readings and class lectures. The Essay Final Examination is comprehensive in that it will cover all work presented in this course. I DO NOT GIVE MAKE UP EXAMS. (Read the note below, under philosophy of the instructor).

B) News journal: For this assignment, follow for a period of time the development of a current issue in the news, by collecting news articles on your subject. At the end of the semester, you will use the clippings in a written short analysis of the subject. Three times during the semester I will check your journal. You should tape the article on a separate (probably loose leaf paper) sheet of paper and

on the back of that paper write down any issues, comments, facts, etc., that strike your interest. The journal entries count for 15% of your final grade. **STUDENTS MUST USE THE CHRISTIAN SCIENCE MONITOR NEWSPAPER FOR THIS PROJECT!!**

C) Team assignments and presentation: Teams will be assigned and from there each team will come up with an issue of social or ethical dimensions and create a formal presentation and short paper. The issues-topics and requirements will be presented on the first day of class.

D) College life activities: These activities will help you get your familiar with the services available to you here at DeVry. These activities will help you to focus on your interests and goals as a student. In addition to the bi-weekly activities students are to create an electronic portfolio. This portfolio will be updated as you continue in your studies here at DeVry. You will submit bi-weekly assignments and progress reports related to this project.

E) eCollege activities: Is part of the hybrid learning model here at DeVry. All students are required to participate on it each week. Your participation in eCollege will be part of your evaluation for this course.

Final Examination: Will be a comprehensive written exam. Sample questions will be offered. The exam will cover all materials covered in class, in the readings, and regarding the simulation and group projects. The final will be evaluated on style and content.

V. **Instructor Expectations:**

As a student, you are expected to read, understand and follow the procedures and rules of conduct as stated in the DeVry University Student Handbook (<http://www.ny.devry.edu/studentservices/stuhandbook.asp>).

See me to discuss what action we can take if you are having problems. I am here to help you, so please see me before little problems become **BIG** ones.

[Specific Regulations]

- 1) Again, you are expected to have the assigned readings completed on the date the topic will be discussed. A quiz may be given on that day or you may be called upon in class.
- 2) I am VERY STRICT about make up exams. You must have a legitimate excuse (such as Medical care, death).
- 3) I am VERY STRICT about granting incompletes. Only in an extreme case will I even consider that option.
- 4) **General Education Attendance Policy:** Attendance will be taken within the first 10 minutes of the class. Students who are not present when attendance is taken will be marked as absent. Students who arrive after attendance is taken are strongly encouraged to stay in the class, however they will not be marked present. There will be no partial credit given for lateness.
- 5) **APA Format and Documentation:** At DeVry, all student papers should use the APA system for essay format and documentation. Information on this format is provided on the following website: ([http://webster.comnet.edu/apa/apa\\_index.htm](http://webster.comnet.edu/apa/apa_index.htm)) or APA Crib sheet (<http://www.wooster.edu/psychology/apa-crib.html> ).
- 6) **A Note on Plagiarism:** Plagiarism is defined by the American College Dictionary as "...copying or imitating the language, ideas, and thoughts of another author and passing off the same as one's original work." **Plagiarism is clear grounds for failure and possible dismissal from DeVry. If you are in doubt about the definition and seriousness of plagiarism, check pages 18- 20 of the DeVry Student Handbook or with the college handbook or see the instructor.** The responsibility in this matter is solely that of the student. Disclaiming intent not to plagiarize is not a valid defense.
- 7) The Honor System: Any one receiving or giving answers or talking during any examination or test given during class will receive a ZERO for that assignment and will receive a (F) for a final course grade.
- 8) Participation: Students must be prepared to discuss assigned material when they enter class each week. Group participation is mandatory. Scores will be assigned as a portion of group projects based on active participation in the group. Participation and attendance will be evaluated individually and within groups. Participation on eCollege (iOptimize) will count for 10% of your final grade.
- 9) Respect: The relationship established by the instructor and the student is very special in encouraging educational development. I offer respect to my students and I expect the same in return. Students should refrain from talking while the lecture is taking place. If you have a question, of course you may ask it. **Turn your beepers and cell phones to silent mode since they disrupt the class.** Rude behavior will not be tolerated at any time during lectures or discussions.

VI. **Course Outline:**

<u>Week</u>	<u>Classroom Topics</u>	<u>Reading Assignment</u>	<u>Deliverables</u>
TCOs		(chapter numbers and pages from the text) Read before class.	
<b>1</b>	Class orientation: Syllabus, procedures, etc.		Write your personal mission statement
TCOs 9,11, 12	Instructor and student introductions  Introduce: Academic Mission Statement and Plan of Study* Study Skills & Time Management Plan*  Introduce Team Project  Discuss working in Teams  What is Critical Thinking	Read Appendix I and II of this syllabus and Chapter 3 of the Power book	
<b>2</b>	Form teams;		
TCOs 2,3,10	<b>Desert Survival</b>  Library Resources and Research  Evaluating internet sources  §Internet vs. Library Resources		
<b>3</b>	Working groups and teams		

<p>TCOs 3, 8</p>	<p>Group dynamics Group leadership and participation</p> <p><b>TEAM WORK</b></p> <p>Choose a team name for your project. Discuss team interaction and dynamics, choosing leadership. Analyze your problem, generate tentative possible strategies. Assign each member to research part of the problem.</p>		
<p><b>4</b> TCOs 3, 8</p>	<p>Problem solving and conflict resolution Learning and team work using the internet</p> <p><b>TEAM WORK</b></p> <p>Develop your team charter</p>		
<p><b>5</b> TCOs 1, 2, 4</p>	<p>Problem Solving Definition and research</p> <p><b>TEAM WORK</b></p> <p>Discuss case problem definition, causes, and possible</p>		

	solutions.		
<b>6</b>	Problem Solving		
TCOs	Decision analysis		
1, 2, 4	Implementing solutions		
	Evaluating solutions		
	<b>TEAM WORK</b>		
	Establish criteria and focus on decision making.		
<b>7</b>	Logical reasoning for problem solving		
TCOs	Avoiding logical fallacies		
5, 6, 7	<b>TEAM WORK</b>		
	Establish criteria/ boundaries for your problem and possible solutions (What would conditions be like after creating the perfect solution?)		
<b>8</b>	<b>Midterm</b>		
TCOs			
1,2 , 3, 4, 5, 6, 7			
<b>9</b>	Personal Financial Planning		
TCOs	Evaluate Holmes's use of logic in The Adventure of the Cardboard Box.		
1, 5, 11			

	Analyze arguments in letters to the editor.  <b>TEAM WORK</b>  Create an implementation plan and brainstorm activities to complete implementation plan, assign responsibilities.		
<b>10</b> TCOs 4, 6	Communicating your work to others: creating oral presentations  <b>TEAM WORK</b>  Discuss how your case problem solution could be evaluated.		
<b>11</b> TCOs 2,4,6, 13	Communicating your work to others: creating written reports  Documenting your paper – MLA/APA styles  <b>TEAM WORK</b>  Develop rough draft of your final paper		
<b>12</b> TCOs 2,4,6, 11,13	Evaluating your communication skills  <b>TEAM WORK</b>  Review and revise your final paper and begin work on your presentation		
<b>13</b>	<u>Academic Mission Statement and Plan of Study</u> <u>Formal Contract Delivery and Signing</u>		

TCOs	<b>TEAM WORK</b>		
12	Review and revise your final presentation		
<b>14</b>	<b><u>TEAM PRESENTATIONS</u></b>		
TCOs	<u>Reflections on team process – what will you do in your next group?</u>		
ALL			
<b>15</b>	<b><u>FINAL EXAMINATION</u></b>		
TCOs			
ALL			

**Appendix I**

**Critical thinking definitions**

*Contributed by Barbara Fowler, Longview Community College.*



The following are definitions of Critical Thinking according to the people who write textbooks and articles on the subject. While this does not make them automatically correct, it does indicate that they have spent some time thinking about the topic. The best definition for Critical Thinking may well be your own - to help with that task, the best approach to the topic I found was written by **Peter A. Facione, Dean of the College of Arts and Sciences, Santa Clara University**. His article [can be found on the web](#) and ordered for educational purposes for \$0.80. (An order form is at the end of the article.)

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Critical thinking is deciding rationally what to or what not to believe."

Norris, Stephen P. "Synthesis of Research on Critical Thinking. *Educational Leadership*, v 42 n 8 May 1985. 40-45.

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"Critical thinking is the use of those cognitive skills or strategies that increase the probability of a desirable outcome. It is used to describe thinking that is purposeful, reasoned and goal directed - the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions when the thinker is using skills that are thoughtful and effective for the particular context and type of thinking task. Critical thinking also involves evaluating the thinking process - the reasoning that went into the conclusion we've arrived at the kinds of factors considered in making a decision. Critical thinking is sometimes called directed thinking because it focuses on a desired outcome."

Halpern, Diane F. *Thought and Knowledge: An Introduction to Critical Thinking*. 1996.

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Critical thinking is the formation of logical inferences.

Simon and Kapplan, 1989.

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Critical thinking is the development of cohesive and logical reasoning patterns. Stahl and Stahl, 1991.

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Critical thinking is careful and deliberate determination of whether to accept, reject, or suspend judgment.

Moore and Parker, 1994.

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"The purpose of critical thinking is, therefore, to achieve understanding, evaluate view points, and solve problems. Since all three areas involve the asking of questions, we can say that critical thinking is the questioning or inquiry we engage in when we seek to understand, evaluate, or resolve."

Maiorana, Victor P. *Critical Thinking Across the Curriculum: Building the Analytical Classroom*. 1992.

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Critical thinking skills: understanding the meaning of a statement, judging ambiguity, judging whether an inductive conclusion is warranted, and judging whether statements made by authorities are acceptable.

Smith, 1990.

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Critical thinking is "the examination and testing of suggested solutions to see whether they will work."

Lindzey, Hall, and Thompson, 1978.

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"Broadly speaking, critical thinking is concerned with reason, intellectual honesty, and open-mindedness, as opposed too emotionalism, intellectual laziness, and closed-mindedness. Thus, critical thinking involves: following evidence where it leads; considering all possibilities; relying on reason rather than emotion; being precise; considering a variety of possible viewpoints and explanations; weighing the effects of motives and biases; being concerned more with finding the truth than with being right; not rejecting unpopular views out of hand; being aware of one's own prejudices and biases, and not allowing them to sway one's judgment." Kurland, Daniel J. *I Know What It Says . . . What does it Mean?* 1995.

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Critical thinking is "reasonably and reflectively deciding what to believe or do."

Ennis (1985)

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Critical thinking is "the art of thinking about your thinking while you are thinking in order to make your thinking better: more clear, more accurate, or more defensible."

Paul, Binker, Adamson, and Martin (1989)

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Critical thinking is "a process which stresses an attitude of suspended judgment, incorporates logical inquiry and problem solving, and leads to an evaluative decision or action."

NCTE Committee on Critical Thinking and the Language Arts.

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"Critical thinking includes the ability to respond to material by distinguishing between facts and opinions or personal feelings, judgments and inferences, inductive and deductive arguments, and the objective and subjective. It also includes the ability to generate questions, construct, and recognize the structure of arguments, and adequately support arguments; define, analyze, and devise solutions for problems and issues; sort, organize, classify, correlate, and analyze materials and data; integrate information and see relationships; evaluate information, materials, and data by drawing inferences, arriving at reasonable and informed conclusions, applying understanding and knowledge to new and different problems, developing rational and reasonable interpretations, suspending beliefs and remaining open to new information, methods, cultural systems, values and beliefs and by assimilating information."

MCC General Education Initiatives

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Uses of critical thinking:

"underlies reading, writing, speaking, and listening . . . the basic elements of communication"

"plays an important part in social change . . . institutions in any society - courts, governments, schools, businesses - are the products of a certain way of thinking."

"helps us uncover bias and prejudice."

"is a path to freedom from half-truths and deceptions."

"the willingness to change one point of view as we continue to examine and re-examine ideas that may seem obvious. Such thinking takes time and the willingness to say three subversive words: *I don't know.*"

Critical thinkers: distinguish between fact and opinion; ask questions; make detailed observations; uncover assumptions and define their terms; and make assertions based on sound logic and solid evidence.

Ellis, D. *Becoming a Master Student*, 1997.

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Attributes of a critical thinker:

- asks pertinent questions
- assesses statements and arguments
- is able to admit a lack of understanding or information
- has a sense of curiosity
- is interested in finding new solutions
- is able to clearly define a set of criteria for analyzing ideas
- is willing to examine beliefs, assumptions, and opinions and weigh them against facts
- listens carefully to others and is able to give feedback
- sees that critical thinking is a lifelong process of self-assessment
- suspends judgment until all facts have been gathered and considered
- looks for evidence to support assumption and beliefs
- is able to adjust opinions when new facts are found
- looks for proof
- examines problems closely
- is able to reject information that is incorrect or irrelevant

Ferrett, S. *Peak Performance* (1997).

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"Critical thinking is best understood as the ability of thinkers to take charge of their own thinking. This requires that they develop sound criteria and standards for analyzing and assessing their own thinking and routinely use those criteria and standards to improve its quality."

Elder, L. and Paul, R. "Critical Thinking: Why we must transform our teaching." *Journal of Developmental Education* 18:1, Fall 1994, 34-35.

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### Definitions of Critical Reading:

"(1) the process of making judgments in reading: evaluating relevancy and adequacy of what is read . . . " (2) an act of reading in which a questioning attitude, logical analysis, and inference are used to judge the worth of what is read according to an established standard . . . Among the identified skills of critical reading involved in making judgments are those having to do with the author's intent or purpose; with the accuracy, logic, reliability and authenticity of writing; and with the literary forms, components, and devices identified through literary analysis."

Harris and Hodges. (1981). *A Dictionary of Reading and Related Terms*, 74.

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Critical evaluation is "the process of arriving at a judgment about the value or impact of a text by examining its quality in terms of form, style, and rhetorical features, the readability of the author and the consistency between ideas it presents and the reader's experience, including . . . internal evaluation . . . and external evaluation . . ."

Harris and Hodges. (1995). *The Literacy Dictionary*, 48.

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Critical readers are:

- willing to spend time reflecting on the ideas presented in their reading assignments
- able to evaluate and solve problems while reading rather than merely compile a set of facts to be memorized
- logical thinkers
- diligent in seeking out the truth
- eager to express their thoughts on a topic
- seekers of alternative views on a topic

- open to new ideas that may not necessarily agree with their previous thought on a topic
- able to base their judgments on ideas and evidence
- able to recognize errors in thought and persuasion as well as to recognize good arguments
- willing to take a critical stance on issues
- able to ask penetrating and thought-provoking questions to evaluate ideas
- in touch with their personal thoughts and ideas about a topic
- willing to reassess their views when new or discordant evidence is introduced and evaluated
- able to identify arguments and issues
- able to see connections between topics and use knowledge from other disciplines to enhance their reading and learning experiences

Schumm, J. S. and Post, S. A. (1997). *Executive Learning*, 282.

Appendix II

Bloom's Taxonomy \*

Benjamin Bloom created this taxonomy for categorizing level of abstraction of questions that commonly occur in educational settings. The taxonomy provides a useful structure in which to categorize test questions, since professors will characteristically ask questions within particular levels, and if you can determine the levels of questions that will appear on your exams, you will be able to study using appropriate strategies.

Competence	Skills Demonstrated
<p><b>Knowledge</b></p>	<ul style="list-style-type: none"> <li>• observation and recall of information</li> <li>• knowledge of dates, events, places</li> <li>• knowledge of major ideas</li> <li>• mastery of subject matter</li> <li>• <i>Question Cues:</i> list, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc.</li> </ul>
<p><b>Comprehension</b></p>	<ul style="list-style-type: none"> <li>• understanding information</li> <li>• grasp meaning</li> <li>• translate knowledge into new context</li> <li>• interpret facts, compare, contrast</li> <li>• order, group, infer causes</li> <li>• predict consequences</li> <li>• <i>Question Cues:</i> summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss,</li> </ul>

	extend
<b>Application</b>	<ul style="list-style-type: none"><li>• use information</li><li>• use methods, concepts, theories in new situations</li><li>• solve problems using required skills or knowledge</li><li>• <i>Questions Cues:</i> apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover</li></ul>
<b>Analysis</b>	<ul style="list-style-type: none"><li>• seeing patterns</li><li>• organization of parts</li><li>• recognition of hidden meanings</li><li>• identification of components</li><li>• <i>Question Cues:</i> analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, explain, infer</li></ul>
<b>Synthesis</b>	<ul style="list-style-type: none"><li>• use old ideas to create new ones</li><li>• generalize from given facts</li><li>• relate knowledge from several areas</li><li>• predict, draw conclusions</li><li>• <i>Question Cues:</i> combine, integrate, modify, rearrange, substitute, plan, create, design, invent, what if?, compose, formulate, prepare, generalize, rewrite</li></ul>

<b>Evaluation</b>	<ul style="list-style-type: none"><li>• compare and discriminate between ideas</li><li>• assess value of theories, presentations</li><li>• make choices based on reasoned argument</li><li>• verify value of evidence</li><li>• recognize subjectivity</li><li>• <i>Question Cues</i> assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize</li></ul>
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\* Adapted from: Bloom, B.S. (Ed.) (1956) *Taxonomy of educational objectives: The classification of educational goals: Handbook I, cognitive domain*. New York ; Toronto: Longmans, Green.