

Critical Thinking for the 21st Century

Duration: Approximately 28 hours of coursework with personal facilitation, to be completed in a four week span.

Price: CDN\$1,975

Discounts: We offer multiple discount options. [Click here](#) for more info.

Delivery Options: This course is available **on-demand** with personal facilitation.

Students Will Learn

- The importance of critical thinking skills for 21st century workers
- How to identify and analyze credible facts and evidence to reach sound conclusions
- How to identify and differentiate between sound thinking, magical thinking, pseudoscience, skepticism, and cynicism
- To analyze and create graphical and tabular visualizations
- The basics of memory and information retrieval, how the way the brain functions affects our thinking, and why it is so difficult and unusual for people to change their minds when confronted by new evidence
- The many types of propaganda encountered in virtually all communications, and how to filter through it to find actual useful information
- The role of journalism, the importance of accuracy, the omnipresence of bias, and ways to identify reliable news sources
- Techniques for gathering reliable information; the importance of expertise
- The many cultural and behavioral biases that lead to poor decision-making by even the most exceptional and brilliant minds
- Basic statistical terminology and how to analyze statistical information, including distribution, deviation, correlation, causation and the law of large numbers
- The nature of logic and argument, premises and conclusions, deductive and inductive arguments, validity and soundness, strong and weak arguments, and formal and informal fallacies
- How to make a decision, including the Franklin analysis, cost-benefit analyses, weighted decision analysis, expected value analysis and multi-criteria decision analysis

Course Description

Critical Thinking is the process of performing analysis that is objective, logical, logically consistent, fair, and informed by evidence, in order to form a judgment, make a decision,

or determine the truth. *Critical Thinking for the 21st Century* teaches students to think critically in their personal and professional lives.

The course teaches practical skills and provides practical experience to individuals who need to develop competence and/or refine expertise in the thought processes necessary for success in the 21st century service- and information-based economy.

The course teaches and provides practice in making logical arguments, as well as assessing, weighing and analyzing evidence. We discuss the ways in which brain biology affects memory and decision-making, how emotions often muddle our thinking, whether or not we are aware of these emotions, and how to work around these challenges. We examine how techniques of persuasion and propaganda affect our thinking, often more than we know, and what we can do to counteract such effects. We address the problem of obtaining accurate, reliable and unbiased information from the news media and other sources of information, and we explore the subject of understanding and presenting visual information.

We examine the many biases that are built into the human condition, and which so often defeat logical reasoning. We take a practical look at statistics, examine how to argue and understand arguments effectively, and study guidelines and techniques for effective decision-making. Finally, we look at commonly misunderstood words, the irrational process involved in conspiracy theories, the effect of advertising on behavior, the effect and use of fear in popular culture, and the habits of good critical thinkers.

Each course module is self-contained, so, while students are generally best served if they complete the entire course, students and enterprises may opt to eschew any material that is judged to be unnecessary or irrelevant to them.

Course Prerequisites

A high school education, GED, or equivalent experience. Familiarity with basic computer functions (sending and receiving email, using a web browser, running apps, downloading apps) is helpful but not required.

Course Overview

Critical Thinking in the 21st Century

- The cost of ineffective thinking
- Critical thinking in formal education
- Success, uplift and enrichment
- The characteristics of good critical thinking
- The practical approach

Facts and Evidence

- Truth: the search for accuracy and understanding
 - The willingness to change our minds
 - The role of morality in critical thinking
 - Expectations and assumptions

Logic

- The nature of logic
 - The nature of argument
 - Premises and conclusions
 - Deductive and inductive arguments
 - Visual representations of logic
- Evaluating arguments

- The nature of evidence
- Descriptions and evaluations
 - Types of descriptions
 - Types of evaluations
 - The weight of evidence
 - The use of evidence
 - Essential analysis of evidence
 - Analysis of evidence: case study
 - Justification and Explanation
- Science
 - What science is not
 - The problem with science
 - Science in the press
 - The characteristics of good (and bad) studies
 - The problem with scientists
 - Scientific jargon
 - Is science to be trusted?
 - The scientific method
 - Problems with the scientific method
 - Everyday applications of the scientific method
- Evaluating deductive arguments
 - Validity and soundness
 - Evaluating inductive arguments
 - Strong and weak arguments
- Propositional logic
 - Necessary and sufficient conditions
- Logical challenges
 - Circular reasoning
 - Clarity and precision
 - Inference and chains of inference
- Implicit premises
 - Simplicity
 - Consistency
 - Discretion
- Fallacies
 - Formal fallacies
 - Informal fallacies
 - Fallacies of note

Visualization

- Visual impairment
- Outlines
- Tables
- Spreadsheets
- Pie charts
- Bar and column graphs
- Line graphs
- Scatter charts
- Area charts
- Bubble charts
- Pivot tables/charts
- Org charts
- Concept maps
- Sequence charts
- Venn diagrams

Memory and the Brain

- Memory
 - What is memory?
 - How memory works
 - Filtering and storage; short- and long-term memory
 - Conscious and unconscious processing
 - The re-assembly of memories
 - Case study: a day in the life
- Failures of Memory

Information Sources

- Expertise
 - The need for accurate information
 - Whom do we trust?
 - The matter of the elite
 - Identifying an expert
 - The Reference Desk
- The Internet and the World Wide Web
 - Search engines
 - How to perform a basic web search
 - Vetting the Net: guidelines to identifying trustworthy sources)
 - Blogs
 - Wikipedia
- Known good web sources

Decision Making

- Practical decision-making
 - Criteria
 - Urgency and Importance
 - Self-awareness
 - Emotions and comfort
 - The Gut
 - How much is enough information?
 - When to decide
- Behavioral (reptilian) complications

- Forgetting
- Why memories change
- Should we trust memories?
- Coping with an unreliable brain
 - To improve your memory – really
 - To improve your memory – Caveat emptor
 - The practical approach to memory enhancement
- Conviction
 - The consequences of conviction
 - How to change your mind
- Anger
 - How it works
 - Effect on reason
 - Fear and anger
- Opportunity cost
- Loss aversion
- Choice architecture
- Risk
- Consensus Building
- How to Make a Decision
 - Cost-benefit Analyses
 - The Franklin Analysis
 - Weighted Decision Analysis
 - Expected Value Analysis
 - Multi-criteria Decision Analysis

Reality

- Magical thinking
- Pseudoscience
- Skepticism
- Skeptical inquiry
- When to be skeptical
- Cynicism
- Criticism
- Critical analysis
- Simplification
- How to simplify
- Over-simplification

Statistics

- Mathematical Information Analysis
 - Practical applications
 - Probability
- Foundations
 - Variables and constants
 - Distribution
 - Normal distribution (the bell curve)
 - Mean and median
 - Deviation
 - Standard Deviation
 - Effect size: Statistics and context
- Applied Statistics
 - The Law of Large Numbers
 - Anecdote vs. Statistic
 - Correlation
 - Correlation vs. Causation

Propaganda

- Definitions
 - Effects
 - Fact vs. Opinion
- Manifestations
 - Attacks
 - Distractions
 - Emotion
 - Identity
 - Manipulation
 - Misrepresentation: lies, twists and trickery
 - Social pressure
- How to counteract

Biases

- Biases and fallacies
 - The illusion of objectivity
 - Why we think what we think
- Economic biases
 - Anchoring
 - Fear of loss
 - High price bias
 - False accounting
- Deceptive biases
 - Confirmation bias
 - Extreme and last effect
 - Behavior generalization error
 - Gambler's fallacy
 - Groupthink
 - Reptile reactions
 - Rules of thumb
 - The *Knowing-is-half-the-battle* delusion

- Spurious Correlations
- Reliability and validity
 - Experiments
 - A/B testing
- Managing biases

The Media

- Using the media as a source of information
- The importance of accuracy
- Journalism
- Trust and the media
 - Selection of stories
 - Inaccurate and unreliable stories
 - Objectivity, fairness, and bias
- Trustworthy sources of information
- Forming your own judgments
- Tools to identify bias
- Relevance
- Tools to identify good news sources
- Tools to identify bad news sources

Applied Thinking

- Advertising
- The role of fear in popular culture
- Commonly misused words
- Organizing: *The Magical Number 7, Plus or Minus 2*
- Conspiracy theories
- The bubble
- The habits of good critical thinkers

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