# Critical Thinking & Analysis I

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| **Course Code:** | CP130 | **Co-Requisites:** | N/A | **Pre-Requisites:** | N/A |
| **Course Hours:** | 45.00 | | | | |

## Course Description

The purpose of this course is to introduce students to the concepts of critical thinking, basic Information Technology (IT) concepts and the systems development process commonly used in a business environment. Discussion will centre on some of the approaches to problem-solving undertaken by an analyst, as well as some of the tools available in defining a system. This is an introductory course, which is meant to provide an overview of all phases of the Systems Development Life Cycle.

## Course Delivery

The course content may be presented through a blend of instructional methods, including lecture, Internet, discussion, independent study, audio/video conferencing and videotape.

## Learning Resources

**Computer Programmer Program provided software:**

DreamSpark Premium - Microsoft Visio

## Vocational Learning Outcomes

*This course contributes to the achievement of the following program vocational learning outcomes (PVLO):*

**0180 - Computer Programmer**

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| VLO 1 | use documented solutions to troubleshoot problems associated with software installation and customization. |
| VLO 2 | develop, test, document, deploy, and maintain secure program code based on specifications. |
| VLO 6 | use relevant methodologies, policies, and standards to develop secure program code. |
| VLO 8 | conform to workplace expectations found in information technology (IT) environments. |

## Essential Employability Skills

*This course contributes to the achievement of the following Essential Employability Skills (EES):*

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| EES 4 | apply a systematic approach to solve problems. |
| EES 5 | use a variety of thinking skills to anticipate and solve problems. |
| EES 7 | analyze, evaluate and apply relevant information from a variety of sources. |

## Course Learning Outcomes and Knowledge and Skills

*This course contributes to the achievement of the following Course Learning Outcomes (CLO):*

1. seek out appropriate solutions for problems associated with software installation and customization

1.1 seek out common problem-specific heuristics (rules of thumb) to simplify problem solving

2. follow appropriate methodologies to resolve problems effectively and minimize risk of recurrence

2.1 follow the brute force methodology to try all possible options to solve a limited size problem

2.2 follow the backtracking methodology to reduce the investigated possible options to solve a problem with constraints

2.3 follow problem-specific heuristics to reduce the possible solutions to a problem to a manageable size

2.4 perform root cause analysis

2.5 follow the decomposition methodology to break down big problems into small solvable problems

2.6 follow problem solving techniques such as brute force, backtracking and cause elimination to debug programs

3. recognize personal limits and seek assistance in a timely manner to resolve problems beyond own knowledge and skills

3.1 recognize when pseudocode planning requires knowledge and skills outside your own, and seek assistance

4. use appropriate programming languages to develop and maintain program code to design specifications

4.1 use a programming language to write algorithms for a defined solution

5. use appropriate tools and techniques to develop, test, and maintain program code

5.1 use a flowchart to describe the solution to a problem

5.2 define the inputs and outputs of a problem

5.3 use conditions to exit loops

5.4 use a decision table to determine which action to apply

5.5 identify the need for a loop to solve a problem

5.6 use pseudocode to describe the solution to a problem

5.7 use decomposition, flowcharts, and pseudocode to define a solution to a problem

6. apply knowledge of a variety of techniques to test and debug programs

6.1 use a table to keep track of loop iterations

6.2 use a table to trace the solution

7. prepare, present, and maintain current, clear, and accurate documentation

7.1 prepare a programming comment from pseudocode to document a solution to a problem

8. justify decisions related to the development of program code

8.1 justify the use of Boolean logical operators (and, exclusive or, inclusive or) to clarify a problem

8.2 justify the use of high-level programming languages and compilers to translate human readable code into a machine readable program

8.3 justify the use of conditional expressions (If, then, else) to break down a problem

8.4 justify the use of recursion instead of iteration to define a solution to a problem

8.5 justify the use of compound expressions to clarify a problem

8.6 justify the use of relation or equal operators to clarify a problem

8.7 justify the use of a linear search over a binary search with unsorted data

8.8 justify the use of a binary search over a linear search with sorted data

8.9 justify the use of linear search for solving simple problems

8.10 justify the time spent planning is seldom wasted when problem solving

**9. use an appropriate software development methodology**

9.1 define iterative software development

9.2 define Rapid Application Development (RAD)

9.3 define waterfall software development

9.4 use ad-hoc development to solve a familiar problem

9.5 define agile software development

9.6 define prototyping software development

**10. Identify appropriate practices, processes, and procedures which ensure quality software development**

10.1 identify and distinguish the goals of an Information System (IS) from Information Technology (IT)

10.2 identify the set of activities that define Application Lifecycle Management (ALM) for a new software product

10.3 describe the components of an Information System (computer hardware, software, data, procedures, and people)

10.4 identify the set of activities that define the Systems Development Life Cycle (SDLC)

**11. Use language and terminology suited to the context**

11.1 identify flowchart symbols

## Course Evaluation

**Activities and Learning Summaries - 35%**

Linked to Course Learning Outcomes: 1, 2, 8, 9, 10
Linked to Essential Employability Skills: 4, 5, 7

**Assignment - 20%**

Linked to Course Learning Outcomes: 1, 2, 3, 4, 5, 6, 7, 9
Linked to Essential Employability Skills: 4, 5, 7

**Quizzes - 20%**

Linked to Course Learning Outcomes: 6, 8, 11
Linked to Essential Employability Skills: 4, 5

**Test - 25%**

Linked to Course Learning Outcomes: 8, 9, 10
Linked to Essential Employability Skills: 7

## Grade Scheme

| A | B | C | D | F |
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| 80% - 100% | 70% - 79.9% | 60% - 69.9% | 50% - 59.9% | Less than 50% |

## Prior Learning Assessment and Recognition

This course is available for challenge or assessment through Prior Learning Assessment and Recognition (PLAR). Please contact the Program Coordinator for more information or look for PLAR on the College website at http://www.confederationc.on.ca/plar

## Course Related Information

Combination of Classroom Lecture/Lab 45 hrs, 3 hours per week

## College Related Information

COLLEGE TEST AND ASSIGNMENT POLICY:
All assignments are due on the assigned date. Late assignments may be accepted, with academic penalty, at the discretion of the individual faculty member. Assignment due dates, late penalties, and/or their acceptance are to be communicated by the faculty at the beginning of the course.

Students are to write tests and quizzes on the dates assigned and within the timelines specified by the professor.

In granting extensions in cases of extenuating or extraordinary circumstances, the professor may request medical certificates or appropriate documentation from the student, at the student's expense, to ensure the legitimacy of the request. Any early departure at the semester's end, early departure or late return at March Break, or other scheduled vacation on the part of the student during the program's academic semester may not be considered as an extraordinary circumstance.

Note: Plagiarism is a serious academic offence. Please refer to the College policy on Academic Integrity for more information.

SERVICES FOR STUDENTS WITH DISABILITIES:
If you are a student with a disability who may require academic accommodation, it is your responsibility to register as early as possible with the Academic Support Centre (Room 153, Shuniah Building) or call (807) 475-6618 to discuss your accommodation needs. (www.confederationc.on.ca/academicsupportcentre)

Students with disabilities who have an Accommodation Plan should be aware that these plans are not shared with the Field Placement Employer. Students with disabilities who feel they may require accommodations during Field Placement should discuss this with staff in the Academic Support Centre.

Students with disabilities always have the opportunity to discuss how their particular disability may impact their college experience.

## Approval Details

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| Approved on: | Tuesday, September 8, 2015 |
| Approved by: | Rick Clace, Associate Dean |
| Prepared by: | Troy Mangatal, Coordinator |
| Approved for: | 2015-2016 |

Please note: this document should be saved for future reference, as it may be needed for certification, credit transfer

and employment purposes.