DURHAM COLLEGE
SUCCESS MATTERS

Faculty of Sci, Eng, & IT

Introduction to Computer Programming

2023-24 Academic Year

Program Title	Ministry Title	Major	Year	Semester
SEIT-Honours Bachelor of Artificial Intelligence	--	HBAI	1	1

Course Code: COSC 11001		**Course Equiv. Code(s):** N/A	
Course Hours: 42		**Course GPA Weighting:** 3	
Prerequisite: N/A			
Corequisite: N/A			
Laptop Course: Yes [X] No [ ]			
Delivery Mode(s): In class [X] Online [ ] Hybrid [ ] Flexible [ ] HyFlex [ ]			
Remote proctoring required Yes [ ] No [X]			
Authorized by (Dean or Director): Tony Doyle	**Date:** August 2023		

Prepared by		
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Course Description:

This course introduces students to the fundamentals of computer programming, focusing on the structured and object-oriented programming paradigms. Students learn about problem solving approaches and strategies for software development and gain practical experience in writing computer programs using modern programming languages and software development tools. The course focuses on elementary data types and data structures, control flow, modularization, algorithm design, program documentation, testing and debugging.

Campus Closure Notice

In the event of a campus closure during which time classes cannot be conducted or attended in person, course delivery will be conducted remotely where possible. Should teaching and learning resume on campus, students may

be organized into smaller groups for classroom delivery, in accordance with directions from public health authorities. In either situation, the learning plan sequence and/or evaluation methods may be adjusted to address topics requiring hands-on, practical learning activities.

Subject Eligibility for Prior Learning Assessment & Recognition (PLAR):

Prior Learning Assessment and Recognition (PLAR) is a process a student can use to gain college credit(s) for learning and skills acquired through previous life and work experiences. Candidates who successfully meet the course learning outcomes of a specific course may be granted credit based on the successful assessment of their prior learning. The type of assessment method (s) used will be determined by subject matter experts. Grades received for the PLAR challenge will be included in the calculation of a student's grade point average.

The PLAR application process is outlined in http://www.durhamcollege.ca/plar. Full-time and part-time students must adhere to all deadline dates. Please email: PLAR@durhamcollege.ca for details.

PLAR Eligibility

Yes [X]   **No** [ ]

PLAR Assessment (if eligible):

[X] Assignment

[X] Exam

[ ] Portfolio

[ ] Other

Course Learning Outcomes

Course Learning Outcomes contribute to the achievement of Program Learning Outcomes for courses that lead to a credential (e.g. diploma). A complete list of Vocational/Program Learning Outcomes and Essential Employability Skill Outcomes are located in each Program Guide.

Ontario Qualfications Framework (OQF)		Course Learning Outcomes (CLOs)
Depth and Breadth of Knowledge	CLO1	Explain how the guidelines for documentation, testing, and debugging are important for software development.
Conceptual & Methodological Awareness	CLO4	Implement Modular and Object Oriented Programming in Python.
Communication Skills	CLO5	Use guidelines for documentation when developing a software product.
Application of Knowledge	CLO2	Develop efficient programs by choosing appropriate data types and control statements.
Professional Capacity/Autonomy	CLO3	Design efficient algorithms and software systems using Python.
Awareness of Limits of Knowledge	CLO6	Analyze project objectives to determine the software development approach that meets the need.
	CLO7	Compare various programming languages in order to implement various AI tools.

Evaluation Criteria:

The Course Learning Outcomes and Essential Employability Skills Outcomes are evaluated by the following evaluation criterion.

Evaluation Description	Course Learning Outcomes		Weighting
In Process: Formative quiz: Python Intro	CLO1, CLO2, CLO5		1
Lab Activity: Lab: Python Intro	CLO1, CLO2, CLO3		1
In Process: Formative quiz: Variables and Constants	CLO2, CLO3, CLO4, CLO5		1
Lab Activity: Lab: Variables and Constants	CLO2, CLO3, CLO5		1
In Process: Formative quiz: Operators	CLO1, CLO2, CLO3, CLO5		1
Lab Activity: Lab: Operators	CLO1, CLO2, CLO3		1
Quiz: Quiz 1:	CLO2, CLO3, CLO4, CLO5		10
In Process: Formative quiz: Conditional and Control statements, Loops	CLO2, CLO3, CLO4, CLO5		1
Lab Activity: Lab: Conditional and Control statements, Loops	CLO2, CLO3, CLO5		1
In Process: Formative quiz: Functions and Modules	CLO2, CLO4		1
Lab Activity: Lab: Functions and Modules	CLO2, CLO4		1
Test: Mid Term	CLO1, CLO2, CLO3, CLO5		20
In Process: Formative quiz: Lists, tuples, sets	CLO2, CLO3, CLO5		1
Lab Activity: Lab: Lists, tuples, sets	CLO2, CLO3, CLO5		1
In Process: Formative quiz: Dictionaries	CLO2, CLO3, CLO5		1
Lab Activity: Lab: Dictionaries	CLO2, CLO3, CLO5		1
In Process: Formative quiz: File I/O	CLO1, CLO2, CLO3, CLO5		1
Lab Activity: Lab: File I/O	CLO1, CLO2, CLO3, CLO5		1
In Process: Formative quiz: OOP I	CLO2, CLO4, CLO5		1

Lab Activity: Lab: OOP I	CLO2, CLO4, CLO5		1
In Process: Formative Quiz: OOP 2	CLO2, CLO4, CLO5		1
Lab Activity: Lab: OOP II	CLO2, CLO4, CLO5		1
Quiz: Quiz 2	CLO2, CLO3, CLO4, CLO5, CLO6		10
Project: Course Project	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6		10
Presentation: Course Project Presentation	CLO1, CLO5, CLO6		10
Test: Final test	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6, CLO7		20
Total			**100%**

Notes:

1. Assignments are due by the due date announced in class and posted on DC Connect. At his or her own discretion, and depending on the nature of the assignment, each professor will provide a facility for the submission of late assignments up to a maximum of 72 hours after the assignment due date. All allowed late submissions will be assessed a penalty of 25% of the total possible grade for the assignment. Assignments should be submitted on time, on a regular basis, to enable you to stay on track within the class.

2. Assignments will normally be marked and returned within 10 days after the due date of each assignment as posted on DC Connect. All marks are conditional upon final review by the professor at the end of the course, at which time marks may be changed if conditions dictate. Examples of conditions that may dictate a change are academic integrity issues.

3. Assessments are considered as copyright material. Students will not copy (in any manner) the material presented in a test or a practice test. Failure to observe this may result in a zero (0) on a test or possible expulsion from the class.

4. Any assignments requiring a presentation must be handed in to the professor a minimum of 48 hours prior to the presentation, in electronic format. It must contain all the items in the presentation, including any presentation notes. Content marks will be based on the pre-presentation electronic submission.

5. Submissions must be of professional quality and use proper academic citation formatting including in-line and References page citations.

6. Plagiarism is a serious breach of the College's Academic Integrity policy. That policy, defined in ACAD-101, and the accompanying procedure defined in ACAD-101-1, will be enforced in any incidents involving plagiarism, of any type. This could include any or all of the following: a mark of zero on an evaluation, a mark of zero in the course, non-admittance to a course or program, withdrawal from a course, or dismissal from the college. In all cases, a formal Academic Alert will be issued that will document the infraction that has taken place, a notification will be given to the Dean/Associate Dean, and a record will be placed in the student's file.

7. Quizzes: Quizzes are scheduled from time to time either at the professor's discretion, or as dictated in the course outline. Quizzes are conducted online either in-class or outside the class time, during a pre-determined window of availability. Once a student begins a quiz, they will have a limited amount of time to complete it before submission is forced and beyond the control of the student. If a student is absent when the quiz is assigned, he/she will receive a mark of "0" for that quiz.

8. Tests: Tests can be both theoretical and practical. The practical aspect of the student's work will be evaluated by means of lab assignments and or testing, verbal or written during said lab assignments. Tests must be written during the scheduled test time in the room designated by the instructor. There will be no "make-up" tests, a student cannot present alternative or replacement work as a substitute except as explained in the next paragraph.

9. Missed Tests: Tests must be written during the scheduled test time. Students who miss a test due to unforeseeable circumstances must contact the professor via email within 24 hours of the missed test. A failure to comply will result in a mark of zero for the test. Faculty will have discretion regarding the eligibility and granting of the request to complete the missed test. The professor may reweigh the value of one missed test to a future assessment or allow one re-write opportunity as the situation allows. Otherwise, a grade of zero will apply.

10. Missed Final Evaluations (that are not tests): Final evaluations must be completed at their scheduled time or submitted on their due date. If students are unable to comply with that date, they must contact their professors within 24 hours of the date. A failure to comply will result in a mark of zero for the final evaluation. Faculty will have discretion regarding the eligibility and granting of the request to complete the missed evaluation. Students will work directly with their faculty to arrange a suitable time/date if applicable.

11. All term issues must be brought to the professor's attention and be resolved by the last class

Required Text(s) and Supplies:

1. Learn Python 3 the Hard Way: A Very Simple Introduction to the Terrifyingly Beautiful World of Computers and Code, First Edition
by Zed A. Shaw
Publisher(s): Addison-Wesley Professional
ISBN: 9780134693866

Recommended Resources (purchase is optional):

1. Python Documentation
https:docs.python.org

Policies and Expectations for the Learning Environment:

General Policies and Expectations:

General College policies related to	**General policies related to**
+ Acceptable Use of Information Technology	**+** attendance
+ Academic Policies	**+** absence related to tests or assignment due dates
+ Academic Integrity	**+** excused absences
+ Standards for Student Conduct for all Learning Environments can be found at https://durhamcollege.ca/wp-content/uploads/Standards-of-Student-Conduct-for-all-Learning-Environments.pdf	**+** writing tests and assignments
+ Information about academic policies and procedures can be found on-line at https://durhamcollege.ca/about/governance/policies	**+** classroom management can be found in the Program Guide (full time programs only) in MyDC https://durhamcollege.ca/mydc/

All students at Durham College have the responsibility to familiarize themselves with and abide by the college's Academic Integrity Policy. Students are expected to complete and submit their own work in an honest manner, in accordance with the policy. Durham College has zero tolerance for breaches of academic integrity. All suspected breaches of academic integrity will be investigated and documented following procedures outlined in the policy, and should a breach be confirmed, appropriate penalties will be levied. Breaches of academic integrity refer to a variety of practices including, but not limited to:

• copying another person's work;
• using unauthorized materials or resources during an evaluation;
• obtaining unauthorized copies of evaluations in advance;
• collaborating without permission;
• colluding or providing unauthorized assistance;
• falsifying academic documents or records;
• misrepresenting academic credentials;
• buying, selling, stealing, soliciting, exchanging or transacting materials or information for the purpose of academic gain;
• bribing or attempting to bribe personnel;
• impersonation;
• submitting the same work in more than one course without authorization;
• improper use of computer technology and the internet;
• depriving others of academic resources;
• misrepresenting reasons for special consideration of academic work;
• plagiarizing or failing to acknowledge ideas, data, graphics or other content without proper and full acknowledgement;
• any unauthorized use of generative or other artificial intelligence.

If you have questions or concerns about what constitutes appropriate academic conduct or research and citation methods, and what your responsibilities are towards academic integrity, please visit the Academic Integrity website on MyDC, reach out to Student Academic Learning Services (SALS), or speak with your professor or Student Advisor.

Course Specific Policies and Expectations:

1. All classwork is expected to be done individually unless specifically stated by the professor. Groups may be assigned or modified by the professor, randomly assigned, or determined by the students at the discretion of the professor. All team members will be expected to contribute equally to the assignments and will be responsible for their individual work.

2. Students are expected to visit and use DC Connect on a regular basis. DC Connect is the primary mean of communication between the professor and the student for all course-related materials. Assignments that require electronic file submissions must be submitted via Dropbox/Turnitin or attached to the appropriate discussion box forums, at the professor's discretion, and not submitted through email.

3. One of the primary goals of our professors is to maintain the learning environment, and electronic distractions can be disruptive to students as well as professors. It is asked that all students assist with maintaining a productive learning environment for all by turning off or muting any cell phones, and electronic devices (including chat programs). Students are expected to abide by the Acceptable Use Policy for all labs and lab equipment.

4. Marks are not given for attendance, however, marks may be given for participation, contribution to group work, or in-class labs; and an opportunity to make up these marks will not be provided. To be successful in this class, it is expected that students will attend all in-person classes and complete all assigned work in a timely and professional manner.

Laptop Policies and Expectations:
5. The student's laptop is expected to be in working condition for all classes/labs. There will be times during a session that the laptop is not required. When asked, the student is expected to close their laptop until instructed to open it again.

6. Computer gaming, chatting and other distractions will not be tolerated during class/lab. Any student participating in the same will be asked to leave the classroom for the remainder of the class/lab, and will be recorded as absent for that class/lab. Students are to read, understand and abide by the Acceptable Use Policies as posted on DC Connect. Strict compliance with these policies is required at all times. Any violation of these policies will result in expulsion from the lab/class and disciplinary actions as deemed by the Associate Dean/Dean.

7. Inappropriate desktop background or screen savers will not be tolerated in accordance with the acceptable use policies.

General Course Outline Notes:

1. Students should use the course outline as a learning tool to guide their achievement of the learning outcomes for this course. Specific questions should be directed to their individual professor.

2. The college considers the electronic communication methods (i.e. DC Mail or DC Connect) as the primary channel of communication. Students should check the sources regularly for current course information.

3. Professors are responsible for following this outline and facilitating the learning as detailed in this outline.

4. Course outlines should be retained for future needs (i.e. university credits, transfer of credits etc.)

5. A full description of the Academic Appeals Process can be found at https://durhamcollege.ca/about/governance/policies/academic-policies .

6. Faculty are committed to ensuring accessible learning for all students. Students who would like assistance with academic access and accommodations in accordance with the Ontario Human Rights Code should register with the Access and Support Centre (ASC). ASC is located in room SW116, Oshawa Campus and in room 180 at the Whitby Campus. Contact ASC at 905-721-3123 for more information.

7. Durham College is committed to the fundamental values of preserving academic integrity. Durham College and faculty members reserve the right to use electronic means to detect and help prevent plagiarism. Students agree that by taking this course all assignments could be subject to submission either by themselves or by the faculty member for a review of textual similarity to Turnitin.com. Further information about Turnitin can be found on the Turnitin.com Web site.

Learning Plan

The Learning Plan is a planning guideline. Actual delivery of content may vary with circumstances.

Students will be notified in writing of changes that involve the addition or deletion of learning outcomes or evaluations, prior to changes being implemented, as specified in the Course Outline Policy and Procedure at Durham College.

Week/Module	Hours:	3	Delivery:	In Class

1

Course Learning Outcomes

CLO1

Intended Learning Objectives/Topics

Install IDE for programming in Python
Write a simple program in Python

Intended Learning Activities

Lecture, Discussion, Problem Solving

Resources and References

Materials, Slides, Code provided in the course shell (dc-connect)

Evaluation	Weighting
In Process: Formative quiz: Python Intro	2
Lab Activity: Lab: Python Intro	

Week/Module	Hours:	3	Delivery:	In Class

2

Course Learning Outcomes

CLO2

Intended Learning Objectives/Topics

Learn to print messages with a specific format
Understand variables and constants
Use of Escape sequences in printing

Intended Learning Activities

Lecture, Discussion, Problem Solving

Resources and References

Materials, Slides, Code provided in the course shell (dc-connect)

Evaluation	Weighting
In Process: Formative quiz: Variables and Constants	2
Lab Activity: Lab: Variables and Constants	

Week/ Module	Hours:	3	Delivery: In Class	
3	**Course Learning Outcomes**			
	CLO2			
	Intended Learning Objectives/Topics			
	Prompt the user to get the input to a variable Enter the data through command line Understand the types of operators including arithmetic, relational and logical operators			
	Intended Learning Activities			
	Lecture, Discussion, Problem Solving			
	Resources and References			
	Materials, Slides, Code provided in the course shell (dc-connect)			
	Evaluation In Process: Formative quiz: Operators Lab Activity: Lab: Operators		**Weighting** 2	

Week/ Module	Hours:	3	Delivery: In Class	
4	**Course Learning Outcomes**			
	CLO2			
	Intended Learning Objectives/Topics			
	Controlling program flow using conditional statements Implement loop control statements Create programs using nested loops and if statements			
	Intended Learning Activities			
	Lecture, Discussion, Problem Solving			
	Resources and References			
	Materials, Slides, Code provided in the course shell (dc-connect)			
	Evaluation Quiz: Quiz 1: In Process: Formative quiz: Conditional and Control statements, Loops Lab Activity: Lab: Conditional and Control statements, Loops		**Weighting** 12	

Week/ Module	Hours:	3	Delivery:	In Class
5	**Course Learning Outcomes**			
	CLO2			
	Intended Learning Objectives/Topics			
	Understand the concept and implementation of functions Create functions for reuse Function arguments and return values Call functions in main program			
	Intended Learning Activities			
	Lecture, Discussion, Problem Solving			
	Resources and References			
	Materials, Slides, Code provided in the course shell (dc-connect)			
	Evaluation		**Weighting**	
	In Process: Formative quiz: Functions and Modules Lab Activity: Lab: Functions and Modules		2	

Week/ Module	Hours:	3	Delivery:	In Class
6	**Course Learning Outcomes**			
	CLO2, CLO3			
	Intended Learning Objectives/Topics			
	- Python Data Structures I: List, tuple, set - Creation, access, and modification - appropriate usage methods			
	Intended Learning Activities			
	Lecture, Discussion, Problem Solving			
	Resources and References			
	Materials, Slides, Code provided in the course shell (dc-connect)			
	Evaluation		**Weighting**	
	Test: Mid Term In Process: Formative quiz: Lists, tuples, sets Lab Activity: Lab: Lists, tuples, sets		22	

Week/ Module	Hours:	3	Delivery:	In Class
8	**Course Learning Outcomes**			
	CLO2, CLO3			
	Intended Learning Objectives/Topics			
	- Python Data Structures 2: Dictionaries- Creation, access, and modification - appropriate usage methods			
	Intended Learning Activities			
	Lecture, Discussion, Problem Solving			
	Resources and References			
	Materials, Slides, Code provided in the course shell (dc-connect)			
	Evaluation			**Weighting**
	In Process: Formative quiz: Dictionaries Lab Activity: Lab: Dictionaries			2

Week/ Module	Hours:	3	Delivery:	In Class
9	**Course Learning Outcomes**			
	CLO1, CLO2, CLO3, CLO5			
	Intended Learning Objectives/Topics			
	Use of file Handling functions to access flat files in a program Reading/Writing structured data to/from file system Learn to find and correct the errors Learn to document your program			
	Intended Learning Activities			
	Lecture, Discussion, Problem Solving			
	Resources and References			
	Materials, Slides, Code provided in the course shell (dc-connect)			
	Evaluation			**Weighting**
	In Process: Formative quiz: File I/O Lab Activity: Lab: File I/O			2

Week/ Module	Hours: 3	Delivery: In Class	
10	**Course Learning Outcomes** CLO4		
	Intended Learning Objectives/Topics Demonstrate features of object oriented programming What is the importance of classes and objects Implement simple classes		
	Intended Learning Activities Lecture, Discussion, Problem Solving		
	Resources and References Materials, Slides, Code provided in the course shell (dc-connect)		
	Evaluation In Process: Formative quiz: OOP I Lab Activity: Lab: OOP I	**Weighting** 2	
Week/ Module	Hours: 3	Delivery: In Class	
11	**Course Learning Outcomes** CLO4		
	Intended Learning Objectives/Topics Design object oriented programs (OOPs) using classes, objects, functions Understand inherited objects in real world Implement inheritance Compare Inheritance and composition in OOPs and its use in various scenarios.		
	Intended Learning Activities Lecture, Discussion, Problem Solving		
	Resources and References Materials, Slides, Code provided in the course shell (dc-connect)		
	Evaluation In Process: Formative Quiz: OOP 2 Lab Activity: Lab: OOP II	**Weighting** 2	

Week/ Module	Hours:	3	Delivery:	In Class

	Course Learning Outcomes
12	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6, CLO7

	Intended Learning Objectives/Topics
	Pandas library Understand, create, modify, access elements of Series and Dataframes Visualize data using pandas

	Intended Learning Activities
	Lecture, Discussion, Problem Solving

	Resources and References
	Materials, Slides, Code provided in the course shell (dc-connect)

	Evaluation	**Weighting**
	Quiz: Quiz 2	10

Week/ Module	Hours:	3	Delivery:	In Class

	Course Learning Outcomes
13	CLO7

	Intended Learning Objectives/Topics
	Demonstrate implementation of project code and documentation.

	Intended Learning Activities
	Lecture, Discussion, Problem Solving

	Resources and References
	Materials, Slides, Code provided in the course shell (dc-connect)

	Evaluation	**Weighting**
	Project: Course Project Presentation: Course Project Presentation	20

Week/ Module	Hours:	3	Delivery:	In Class
14	**Course Learning Outcomes**			
	CLO2, CLO3, CLO4, CLO6, CLO7			
	Intended Learning Objectives/Topics			
	Final Exam			
	Intended Learning Activities			
	Final Test (20%) -			
	Resources and References			
	dc-connect			
	Evaluation		**Weighting**	
	Test: Final test		20	

This course supports the following program(s) and program learning outcomes.

HBAI: Honours Bachelor of Artificial Intelligence

#3. Build machine learning models by evaluating input data and identifying features
that meet the needs of the project.

#5. Design and develop simulated environments according to project specifications
for testing the effectiveness of machine learning models.

#10. Develop software systems using modern programming languages, techniques,
and tools for deploying on different platforms.