SYLLABUS

EXSM 3949 - Python Fundamentals

Full Stack Web Development Diploma

Faculty of Extension | University of Alberta

Course Dates: Sept 4, 2023 – Oct 22, 2023
Location/Format: Online (Synchronous)

Course instructor(s) and contact information:	**Bo Cen bcen@ualberta.ca** **Responses within 48 hours during business days; office hours from 4:00PM to 9PM.**
Program office information:	If you have any concerns or questions regarding the course, you can contact the program staff, Monday through Friday, at techprog@ualberta.ca
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The University of Alberta acknowledges that we are located on Treaty 6 territory, and respects the histories, languages, and cultures of First Nations, Metis, Inuit, and all First Peoples of Canada, whose presence continues to enrich our vibrant community.

ABOUT THE COURSE

Course Description

Python is an interpreted, high-level, and general-purpose programming language that can automate specific series of tasks to make them more efficient. It is often used in software applications, pages within a web browser, and the shells of operating systems. Learn Python programming fundamentals and the basics of developing and running software written in Python.

Course Outcomes

After completing this course, students should be able to:

- Write simple command-line Python programs.
- Demonstrate knowledge of Python programming fundamentals.

Course Materials

- (Optional) Reading:
  Lutz, M. (June 2013). *Learning Python, 5th Edition.* O'Reilly Media, Inc.

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COURSE SCHEDULE

Key Course Dates

All assignment submission deadlines follow **Mountain Time (MT)**, and are listed below.

Please note that online synchronous class times **will be recorded.**
Refer to the Recording in the Classroom policy section of this document for further details.

Module	Key Dates & Times

Module 1
Language Introduction
	September 5, September 11, September 12 @ 7:00PM - 8:30PM
	
	Assignments and Activities
	
	   ● Module 1 Assignment
	      ○ September 17, 2023 @ 11:59PM

Module 2
Language Concept Expansion
	September 18, September 19 @ 7:00PM - 8:30PM
	
	Assignments and Activities
	
	   ● Module 2 Assignment
	      ○ September 24, 2023 @ 11:59PM

Module 3
Unit Testing
	September 25, September 26 @ 7:00PM - 8:30PM
	
	Assignments and Activities
	
	   ● Module 3 Assignment
	      ○ October 1, 2023 @ 11:59PM

Module 4
Data Structures
	October 2, October 3 @ 7:00PM - 8:30PM
	
	   ● Module 4 Assignment
	      ○ October 8, 2023 @ 11:59PM

Module 5
File Input & Output
	October 9, October 10 @ 7:00PM - 8:30PM
	
	Assignments and Activities
	
	   ● Module 5 Assignment
	      ○ October 15, 2023 @ 11:59PM

Module 6
Charting
	October 16, October 17 @ 7:00PM - 8:30PM
	
	   ● Module 6 Assignment
	      ○ October 22, 2023 @ 11:59PM

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N / A	Assignments and Activities
	
	● Project
	    ○ October 22, 2023 @ 11:59PM
	● Final Exam
	    ○ October 22, 2023 @ 11:59PM

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MODULE OVERVIEWS

Module 1: Language Introduction

Topics

- Setting up your Python environment (installation, IDLE & Visual Studio Code integration)

- Anatomy of a Python program (whitespace delimiting)

- Comments

- Console input and output

- Decisions

- Loops

- Exception handling

- Functions

Learning Outcomes

After completing this module, students should be able to:

- Create a program in Python capable of being run from visual studio code.

- Demonstrate understanding of basic programming concepts.

Supplementary (Optional) Readings

- Lutz, M. (June 2013). *Learning Python, 5th Edition.* O'Reilly Media, Inc.
  - Chapter 2. How Python Runs Programs
    - The Programmer's View
  - Chapter 3. How You Run Programs
    - What Not To Type: Prompts and Comments
    - The Input Trick on Windows
  - Chapter 4. Introducing Python Object Types
    - Numbers
    - Strings
  - Chapter 10. Introducing Python Statements

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Activities & Assignments

- Module 1 Quiz

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Module 2: Language Concept Expansion

Topics

- Lists
- Importing libraries
- Math
- Type casting

Learning Outcomes

After completing this module, students should be able to:

- Maintain a list of data in Python
- Perform advanced mathematical operations in Python
- Cast variables to different data types
- Importing libraries that extend functionalities

Supplementary (Optional) Readings

- Lutz, M. (June 2013). *Learning Python, 5th Edition.* O'Reilly Media, Inc.
    - Chapter 3. How You Run Programs
        - Import and Reload Basics
    - Chapter 4. Introducing Python Object Types
        - Math
        - Lists
    - Chapter 5. Numeric Types
        - Other Numeric Types
    - Chapter 22. Modules: The Big Picture
        - Standard Library Modules

Activities & Assignments

- Module 2 Quiz

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Module 3: Unit Testing

Topics

- Unit testing
- Creating unit tests with the built in unittest library

Learning Outcomes

After completing this module, students should be able to:

- Create and run unit tests using unittest to validate Python code.

Supplementary (Optional) Readings

- [Article from Real Python on Unit Testing with unittest](#)

Activities & Assignments

- Module 3 Quiz

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Module 4: Data Structures

Topics

- Enums
- Tuples
- Sets
- Dictionaries
- Dates (datetime)

Learning Outcomes

After completing this module, students should be able to:

- Store and manipulate data in Python's basic data structures.
- Perform functions on dates using the datetime library.

Supplementary (Optional) Readings

- Lutz, M. (June 2013). *Learning Python, 5th Edition.* O'Reilly Media, Inc.
  - Chapter 4. Introducing Python Object Types
    - Dictionaries
    - Tuples
  - Chapter 5. Numeric Types
    - Sets
- Python Documentation on Enumeration
- Python Documentation on datetime

Activities & Assignments

- Module 4 Quiz

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Module 5: File Input & Output

Topics

- Reading and writing files
- JSON in Python

Learning Outcomes

After completing this module, students should be able to:

- Read and write from a text file using Python.
- Encode an object as JSON using Python.

Supplementary (Optional) Readings

- Lutz, M. (June 2013). *Learning Python, 5th Edition.* O'Reilly Media, Inc.
  - Chapter 9. Tuples, Files, and Everything Else
    - Files
    - Storing Python Objects in JSON Format

Activities & Assignments

- Module 5 Quiz

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Module 6: Charting

Topics

- matplotlib

Learning Outcomes

After completing this module, students should be able to:

- Create a visual graph using matplotlib in Python.

Supplementary (Optional) Readings

- [Article from Real Python on matplotlib](#)

Activities & Assignments

- Module 6 Quiz

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COURSE ASSESSMENT & GRADED ACTIVITIES

Assessments Overview and Weighting

Please refer to the "Key Course Dates" section for a list of all assessment due dates.

Assessment	Module	Weighting
● Project	All	**35** %
● Exam	All	**35** %
● Module 1 Assignment	1	**5** %
● Module 2 Assignment	2	**5** %
● Module 3 Assignment	3	**5** %
● Module 4 Assignment	4	**5** %
● Module 5 Assignment	5	**5** %
● Module 6 Assignment	6	**5** %
TOTAL		**100 %**

Marking criteria for all assignments will be specified within the instructions for the assignment. Please review these criteria before completing your assignments.

Assessment Details and Evaluation Criteria

Project

Description / Instructions

A python program demonstrating understanding of data types, decisions, loops, functions, exception handling, file I/O, JSON, unit testing, and data visualization.

Evaluation Criteria

See the rubric on eClass for details.

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Module 1 Quiz

Description / Instructions

A quiz covering topics included in Module 1 (Setting up your Python environment, Anatomy of a Python program, Comments, Console input and output, Decisions, Loops, Exception handling, Function.)

Evaluation Criteria

Evaluation information is available on eClass.

Module 2 Quiz

Description / Instructions

A quiz covering topics included in Module 2 (Lists, Importing libraries, Math, Type casting.)

Evaluation Criteria

Evaluation information is available on eClass.

Module 3 Quiz

Description / Instructions

A quiz covering topics included in Module 3 (Unit testing, Creating unit tests with the built in unittest library.)

Evaluation Criteria

Evaluation information is available on eClass.

Module 4 Quiz

Description / Instructions

A quiz covering topics included in Module 4 (Enums, Tuples, Sets, Dictionaries, Date.)

Evaluation Criteria

Evaluation information is available on eClass.

Module 5 Quiz

Description / Instructions

A quiz covering topics included in Module 5 (Reading and writing files, JSON in Python.)

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Evaluation Criteria

Evaluation information is available on eClass.

Module 6 Quiz

Description / Instructions

A quiz covering topics included in Module 6 (Create a visual graph using matplotlib in Python.)

Evaluation Criteria

Evaluation information is available on eClass.

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Penalty for Late Assessments

In this course, the penalty for late assessments will be a loss of **10%** of the assessment's weight **per day**. If you have extenuating circumstances that will prevent you from handing in your assignments on-time, please contact your instructor *before* the due date to discuss the potential options.

Citation Style

Written assignments must comply with a University-accepted citation style, either MLA or APA. For more information, visit the University Libraries website (www.library.ualberta.ca) and click 'Citation Guides' in the Library Services menu.

Understanding Your Grades

The University of Alberta uses a letter grading system with a four-point scale of numerical equivalents for calculating grade point averages. Grades reflect judgments of student achievement made by instructors. These judgments are based on a combination of absolute achievement and relative performance in a class.

All final results are reported using a letter grade or grade point value.

The following table presents an approximate guide for understanding the relationship between percentage grades and letter grades:

A+	A	A-	B+	B	B-	C+	C	C-	D+	D	F	Letter Grade
96–100	91–95	86–90	81–85	77–80	72–76	69–71	64–68	60–63	55–59	50–54	< 50	% range

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UNIVERSITY & FACULTY OF EXTENSION GRADING POLICY

Official Grade Notification

Students can access and print their final grades *only* through Bear Tracks, an online service provided to University of Alberta students. To log into Bear Tracks, visit https://www.beartracks.ualberta.ca. To learn more about Bear Tracks and your CCID please visit https://www.ualberta.ca/registrar/registration-and-courses/bear-tracks-resources.

Any other edition or statement of a final grade should be considered unofficial, including those released in eClass or by other means. In the rare event access is not available, a hard copy may be requested through the Program Office. Program Offices will not release grades over the telephone under any circumstances. *If you would like to receive an email notifying you when your final grades are available, please sign on to Bear Tracks and visit the Grades section.*

The University of Alberta Grading System

The following table provides information about the meaning of letter grades:

Grading in Continuing Education Courses *		
Descriptor	**Letter Grade**	**Grade Point Value**
Excellent	A+	4.0
	A	4.0
	A-	3.7
Good	B+	3.3
	B	3.0
	B-	2.7
Satisfactory	C+	2.3
	C	2.0
	C-	1.7
Poor	D+	1.3
	D	1.0
Failure	F	0

*These descriptors above to continuing education and undergraduate courses using alpha grades. Graduate courses use an alternative descriptor set.

Courses that are graded using the "completed requirements" criteria use the following grades and remarks:

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Final Grades	Description
CR	Completed requirements; no grade point value assigned.
NC	Failure; no grade point value assigned.

A complete list of current final grades and remarks can be found §23.4 of the University Calendar.

Failing Grades

Students will receive a failing grade under the following conditions:

- if the student has failed to meet the course requirements at the required standards stipulated by the course instructor, e.g. the student's aggregate grade on submitted assignments is lower than the minimum passing grade for the course;

- if the student has failed to withdraw from the course. Non-attendance does not constitute notice of withdrawal from a course. If the student chooses to withdraw from a course, the student must contact the Faculty of Extension Registration Office and submit a written withdrawal request.

Grade Appeals

The assignment of grades is the responsibility of the course instructor. Any concerns regarding grades should first be discussed with the instructor. If the problem is not resolved, students may wish to consult the Faculty of Extension regulations regarding grade appeals. The Faculty of Extension has developed procedures in order that learners who encounter concerns and problems related to academic standing, learning assessment/grades, program requirements, or other matters may have them reviewed equitably and expeditiously. Copies of these procedures can be obtained from the Office of the Dean at 2-240 Enterprise Square, 10230 Jasper Avenue, phone (780) 492-2681.

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Course Outline Policies

Policy about course outlines can be found in the [Academic Regulations](#) section of the University Calendar.

Academic Integrity

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (https://www.ualberta.ca/governance/resources/policies-standards-and-codes-of-conduct/code-of-student-behaviour.html) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

Recording in the Classroom

Audio or video recording, digital or otherwise, of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s).

Please note that online synchronous class times for this course may be recorded for the benefit of the class. Any recordings of this course will be disclosed to other students enrolled in this section of the class, the instructor, and any other teaching assistants and/or course administrators who may support the course. It is recommended that students remove all identifiable and personal belongings from the space in which they will be participating. Students do have the right to not participate in the recording, and in such cases are advised to turn off their cameras and audio recording devices prior to recording; students can still participate in online synchronous sessions through text-based chat. Unless otherwise specified, recordings will be saved to Zoom cloud storage, accessible via eClass, and made available for as long as the course eClass section remains active. Please direct any questions about this digital collection of recordings to your course instructor.

Accommodating Disabilities

If you have a disability or condition that may require some modifications, please contact Accessibility Resources (1-80 Students' Union Building; PH: (780) 492-3381; TTY: (780) 248-1665) and obtain a determination as to what accommodations should be made.

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Withdrawal, Refunds, and Transfer Information

If you wish to drop or withdraw from this course, you must do so by the official drop or withdrawal deadline. Please refer to https://www.ualberta.ca/extension/information/for-students/forms/cancel-registration for information related to official drop and withdrawal policies and deadlines, as well as guidelines to the withdrawal process. Non-attendance does not constitute notice of withdrawal from a course. In graded courses, please note that a failing grade can be assigned to any student who has not officially withdrawn from the course.

Your @ualberta.ca Email Address

The University of Alberta uses email to communicate important information and notices to our students, and you have been automatically assigned an @ualberta.ca email account. It is your responsibility to check your @ualberta.ca email account regularly.

Visit https://www.ualberta.ca/extension/information/for-students/checklist#email for more information.

Applying for Graduation

Continuing Education students who expect to complete the requirements of a certificate or citation program by the end of winter term must apply for graduation by Feb. 1 using Bear Tracks under Academics > My Academics > Graduation.

See https://ext.ualberta.ca/information/policies/graduation for more information.

In Case of Emergency

All students attending classes at Enterprise Square MUST be familiar with the Faculty of Extension's Emergency Protocols in the event of a fire or other emergency situation. Click here to visit emergency protocols: https://bit.ly/2NAZFmR.

Records in General Studies Courses

Faculty of Extension general studies courses (those with the prefix EXGEN) are non-graded and will appear on the transcript as "Non-graded."

Records in Courses in Certificate and Citation Programs

Faculty of Extension courses offered as part of certificate or citation programs are assessed. Any learner, meeting course prerequisites, can take a course that is part of a credentialed program. If you are not registered to take the full program at this time, taking a graded course gives you the opportunity to participate in assessments and earn a grade that reflects your achievement. Grades earned can later be applied to applicable program requirements. Grades earned in Continuing Education courses contribute to your University of Alberta Continuing Education GPA. University of Alberta undergraduate and graduate GPAs are calculated independently.

If you do not wish to complete assessments, receive a grade, or apply course credit to a credential, you must register to "audit" the course. Courses will appear on the transcript as "Audit." Students registered into graded courses that do not self-identify and officially register an audit student will receive the grade earned.

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