DEPARTMENT OF SCIENCE

COURSE OUTLINE – Winter 2024

EG1050 (A3): Computer Programming for Engineers – 3.8 (3-0-1.5) UT 67.5 Hours for 15 Weeks

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

INSTRUCTOR:	Braden Kelly	**PHONE:**	780-539-2963
OFFICE:	J218	**E-MAIL:**	bkelly@nwpolytech.ca
OFFICE HOURS:	TBA		

CALENDAR DESCRIPTION:

Fundamentals of computer programming with emphasis on solving engineering problems. Structure and syntax of computer programs, variables, data types, data structures, control structures, function, input/output operations, debugging, software development process.

PREREQUISITE(S)/COREQUISITE:

Restricted to Engineering Students.

REQUIRED TEXT/RESOURCE MATERIALS:

- Python for Everyone, 3rd Edition, Horstmann, Cay S.; Necaise, Rance D.; Wiley (2019) [required]
- Introduction to Python for Science and Engineering, David J. Pine, CRC Press Taylor & Francis Group (2018) [reference, not required]
- Learning Scientific Programming with Python 2nd Edition, Christian Hill, Cambridge University Press (2020)[reference, not required]

DELIVERY MODE(S):

Lectures: Monday & Wednesday, 8:30-9:50 AM, room E306.

Laboratories: Monday 2:30-5:20PM, room E306.

LEARNING OUTCOMES:

- Upon successful completion of this course a student should be able to:
    1. Use Python to perform a range of matrix and vector operations
    2. Write short Python programs to solve introductory level engineering/scientific problems.
    3. Use Python (matplotlib) to plot data and mathematical functions
    4. Use Python to solve systems of linear equations
    5. Use Python skills in the context of a design process which leads to a modeling tool useful for engineering analysis purposes
    6. Understand when and how to use NumPy and SciPy libraries.
    7. Understand the basics protocols of professional coding best practices

TRANSFERABILITY:

Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at the Alberta Transfer Guide main page http://www.transferalberta.alberta.ca.

** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. **Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability.**

EVALUATIONS:

Evaluations are subject to change. Final syllabus will be uploaded to D2L. late submission of labs will result in a 25% penalty per day that the assignment is late.

Labs	60%	Attendance required. 6 Labs, 10% each.
Quizzes	10%	5 quizzes, 2% each
Final Exam (Comprehensive)	30%	TBA

Late submission of labs will result in a 25% penalty per day the submission is late. Late quizzes will receive a mark of zero.

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GRADING CRITERIA :

Please note that most universities will not accept your course for transfer credit **IF** your grade is **less than C-**.

Alpha Grade	4-point Equivalent	Percentage Guidelines		Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	95-100		C+	2.3	67-69
A	4.0	85-94		C	2.0	63-66
A-	3.7	80-84		C-	1.7	60-62
B+	3.3	77-79		D+	1.3	55-59
B	3.0	73-76		D	1.0	50-54
B-	2.7	70-72		F	0.0	00-49

COURSE SCHEDULE/TENTATIVE TIMELINE:

Week	Subject
1	Course outline, introduction to computing. Jupyter notebooks, Basic Python.
2,3	Understanding fundamentals: variables, lists, tuples, operators. Graphics with Matplotlib
4,5	Logicals and Conditional programming
6,7	Repetition
8,9	Functions, root finding, linear regression, non-linear regression.
10	Input/Output, text and file processing
11	File and Folder manipulation
12	Classes, methods, sorting.
13	Applications and simulations using Python

The schedule is subject to change and functions mainly as providing the most likely order of learning. Updates will be made to the online course outline found on D2L.

Laboratory Work:

Lab assignment due dates:

Activity	Due the Week of
Lab Assignment 1: Programming Basics	Jan 22
Lab Assignment 2: Selection	Feb 5
Lab Assignment 3: Repetition	February 26
Lab Assignment 4: Functions and Structures	March 11
Lab Assignment 5: Text and File Processing	March 25
Lab Assignment 6: Additional Topics	April 10

STUDENT RESPONSIBILITIES:

Students are responsible for all lecture, reading and lab material.

STATEMENT ON ACADEMIC MISCONDUCT:

Academic Misconduct will not be tolerated. For a more precise definition of academic misconduct and its consequences, refer to the Student Rights and Responsibilities policy available at https://www.nwpolytech.ca/about/administration/policies/index.html.

**Note: all Academic and Administrative policies are available on the same page.

Additional Information (Not Optional):

Engineers Rule The World (ERTW).