NORTHWESTERN POLYTECHNIC

DEPARTMENT OF SCIENCE

COURSE OUTLINE – Winter 2026

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:

- Introduction to Python for Science and Engineering 2nd Ed., David J. Pine, CRC Press Taylor & Francis Group (2024) [Required]
- Learning Scientific Programming with Python 2nd Edition, Christian Hill, Cambridge University Press (2020)[reference, not required]

DELIVERY MODE(S):

Lectures: Tuesday & Thursday, 8:30-9:50 AM, room E306.

Laboratories: Friday 2:30-3:50PM, room E306.

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LEARNING OUTCOMES:

- Upon successful completion of this course a student should be able to:
  1. Develop short Python programs to model and solve introductory engineering and scientific problems.
  2. Visualize data and mathematical functions using Python's matplotlib library. including generating and interpreting plots.
  3. Utilize input/output functionality to work with data.
  4. Integrate Python skills by creating tools or models for engineering analysis and decision-making.
  5. Effectively utilize Python libraries, including NumPy and SciPy, for numerical and scientific computing tasks.
  6. Demonstrate foundational knowledge of professional coding best practices, including proper documentation, code organization, and debugging strategies.
  7. Collaborate effectively on coding projects, potentially using version control tools (e.g., Git) to manage and track code development.

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:

Labs	22%	11 Lab assignments, 2% each. Due at end of lab.
Assignments	0%	Practice assignments will be posted followed by solutions.
Quizzes	5%	5 quizzes, 1% each
Programming Project(s)	8%	TBD
Midterm	25%	TBA
Final Exam (Comprehensive)	40%	TBA

Late submission of assessments will result in a 15% penalty per day for projects and a mark of 0% for everything else.

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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: For/While loops
8,9	Functions, root finding, linear regression, non-linear regression.
10	Input/Output, text and file processing
11	Classes, methods, sorting.
12	Applications and Simulations using Python
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.

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Laboratory Work:

Lab assignment due dates:

Activity	Due the Week of
Lab 1: Computer Hardware	Jan 9
Lab Assignment 1: Programming Basics	Jan 16
Lab Assignment 2: Matplotlib	Jan 23
Lab Assignment 3: Selection	Jan 30
Lab Assignment 4: Selection	Feb 06
Lab Assignment 5: Repetition	Feb 13
Lab Assignment 6: Repetition	Feb 27
Lab Assignment 7: Functions	Mar 6
Lab Assignment 8: Functions	Mar 13
Lab Assignment 9: Input/Output	Mar 20
Lab Assignment 10: Classes	Mar 27

Labs are due at the end of the lab. Late labs receive a mark of zero. Attendance is required.

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).

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