COURSE OUTLINE
FALL 2021

	Date	Initials
Prepared by Instructor	27-Aug	E.M.
Approved by Head	03-Sep	amk

1. Calendar Information

ENDG 233
Programming with Data

Fundamental programming constructs and data structures. Algorithm development and problem solving. Programming techniques to facilitate data analysis. Obtaining and cleaning data. Data validation. Data manipulation. Data visualization. Introduction to decision making using machine learning. Applications chosen from all engineering disciplines.

Course Hours: 3 units; H(3-2)
Academic Credit: 3
Calendar Reference: https://www.ucalgary.ca/pubs/calendar/current/digital-engineering.html#47158

2. Learning Outcomes

At the end of this course, you will be able to:

1. Solve algorithmic logic problems using flowcharts and pseudocode
2. Develop simple computer programs using the foundational structures of a high-level computer language
3. Apply coding techniques for data input, analysis, and output
4. Read and write the basic syntax of the Python programming language
5. Translate engineering problem specifications into software solutions

3. Timetable

Section	Day(s) of the Week	Time	Location
LEC 01	R	10:00 - 11:15	ICT 217
LAB 01	F	8:00 - 9:50	ICT 217
LEC 02	R	8:30 - 9:45	ICT 114
LAB 02	M	9:00 - 10:50	ICT 114
LEC 03	W	9:00 - 10:15	ENG 03
LAB 03	M	9:00 - 10:50	ENG 03
LEC 04	W	10:30 - 11:45	ENG 224
LAB 04	M	10:00 - 11:50	ENG 224
LEC 05	R	10:00 - 11:15	ENE 123/ENE 127
LAB 05	W	8:00 - 9:50	ENE 123/ENE 127
LEC 06	R	13:00 - 14:45	ICT 217
LAB 06	F	15:00 - 16:50	ICT 217
LEC 07	R	15:00 - 16:15	ICT 114
LAB 07	M	14:00 - 15:50	ICT 114
LEC 08	W	14:30 - 15:45	ENG 03
LAB 08	M	13:00 - 14:50	ENG 03

LEC 09	W	13:00 - 14:15	ENG 224
LAB 09	M	13:00 - 14:50	ENG 224
LEC 10	R	13:00 - 14:15	ENE 123/ENE 127
LAB 10	W	15:00 - 16:50	ENE 123/ENE 127
LEC 11	R	13:00 - 14:15	WEB
LAB 11	W	15:00 - 16:50	WEB

4. Course Instructors

Course Coordinator

Section	First Name	Family Name	Phone	Office	Email
ALL	Emily	Marasco	403-210-6432	ICT 309	eamarasc@ucalgary.ca

Active Learning Instructors

Section	Instructor Name	Email
01/02	Steve Liang	liangs@ucalgary.ca
03/09/11	Reeta Suman	rsuman@ucalgary.ca
04/08	Leanne Dawson	ladawson@ucalgary.ca
05/10	Maan Khedr	maan.khedr@ucalgary.ca
06/07	Mohammad Mansouri Habibabadi	mohammad.mansourihab@ucalgary.ca

Teaching Assistants

See information posted to course D2L site.

5. Assessments

There will be no final examination held in this course.

There will be in-class graded assessments as part of the active learning exercises. Students will require a computer and internet connection to complete these exercises. If a student is unable to bring a laptop to class, they may contact their active learning instructor about borrowing a Schulich laptop for the duration of the activity. Students in Section 11 may request an alternate submission window due to time zone constraints by contacting their active learning instructor. See "Guidelines for Completing and Submitting Coursework" under Section 10 for more information about the in-lab exercise submission.

There will be 2 online, synchronous term tests during the scheduled first-year assessment block. Students will require access to a computer and internet. Students may receive a different version of the test from their peers.

Students in Section 11 will be given the option to complete the tests at alternate start times in the 24 hours prior to the scheduled synchronous time. Requests for alternate start times will be handled by the Engineering Student Centre and the process will be communicated via D2L. An instructor will be available by email in case of questions or technical difficulties.

All tests are open-book and open-notes. You are permitted to access your own course notes, the textbook, and the course D2L site. You are not permitted to search the internet, communicate with classmates, or use other tools unless specified by the instructor. More information on the test questions and format will be provided in advance.

Term Test 1
Start date/time: October 26, 9:30 am
Due date/time: October 26, 10:45 am
Length: 60 minutes + 15 minutes for submission/technical issues
Alternate start time #1: October 25, 4:30 pm MT
Alternate start time #2: October 25, 9:30 pm MT

Term Test 2
Start date/time: November 23, 9:30 am
Due date/time: November 23, 10:45 am
Length: 60 minutes + 15 minutes for submission/technical issues
Alternate start time #1: November 22, 4:30 pm MT
Alternate start time #2: November 22, 9:30 pm MT

6. Use of Calculators in Examinations

N/A

7. Final Grade Determination

The final grade in this course will be based on the following components:

Component	Learning Outcome(s) Evaluated	Weight
Video Checks (best 10 of 12)	1, 2, 3, 4	10%
In-Lab Exercises (best 5 of 7)	1, 2, 3, 4	10%

Portfolio Assignments (3)	1, 2, 3, 4, 5	30%
Portfolio Project	1, 2, 3, 4, 5	25%
Term Tests (2)	1, 2, 3, 4, 5	20%
Graduate Attribute Reflections	5	5%

Total:	100%

Notes:
a) It is necessary to earn a passing grade on the course project in order to pass the course as a whole.

b) Conversion from a score out of 100 to a letter grade will be done using the conversion chart shown below. This grading scale can only be changed during the term if the grades will not be lowered.

Letter Grade	Total Mark (T)
A+	$T \geq 95.0\%$
A	$90.0\% \leq T < 95.0\%$
A-	$85.0\% \leq T < 90.0\%$
B+	$80.0\% \leq T < 85.0\%$
B	$75.0\% \leq T < 80.0\%$
B-	$70.0\% \leq T < 75.0\%$
C+	$65.0\% \leq T < 70.0\%$
C	$60.0\% \leq T < 65.0\%$
C-	$56.0\% \leq T < 60.0\%$
D+	$53.0\% \leq T < 56.0\%$
D	$50.0\% \leq T < 53.0\%$
F	$T < 50.0\%$

8. Textbook

The following textbook(s) is required for this course:

Title	zyBook - ENDG 233: Programming with Data
Author(s)	Bailey Miller
Edition, Year	ISBN 978-1-394-12805-1, online interactive textbook for Fall 2021
Publisher	Wiley / Zyante Inc.

9. University of Calgary Policies and Supports

*SSE ADVISING AND POLICIES

All Schulich School of Engineering students have access to a D2L site titled “Engineering Student Centre”. Students have a responsibility to familiarize themselves with the policies available on this site.

*ACADEMIC MISCONDUCT
Academic Misconduct refers to student behavior which compromises proper assessment of a student’s academic activities and includes: cheating; fabrication; falsification; plagiarism; unauthorized assistance; failure to comply with an instructor’s expectations regarding conduct required of students completing academic assessments in their courses; and failure to comply with exam regulations applied by the Registrar.

For information on the Student Academic Misconduct Policy and Procedure please visit:
https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Academic-Misconduct-Policy.pdf
https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Academic-Misconduct-Procedure.pdf
Additional information is available on the Academic Integrity Website at https://ucalgary.ca/student-services/student-success/learning/academic-integrity.

*ACADEMIC ACCOMODATION
It is the student’s responsibility to request academic accommodations according to the University policies and procedures listed below. The Student Accommodations policy is available at https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf.

Students needing an accommodation based on disability or medical concerns should contact Student Accessibility Services (SAS) in accordance with the Procedure for Accommodations for Students with Disabilities (https://www.ucalgary.ca/policies/files/policies/https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf). SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/.
Students needing an accommodation in relation to their coursework or to fulfil requirements for a degree based on a Protected Ground other than Disability, should communicate this need by submitting a SSE Request for Academic Accommodation Form (ESC D2L - Forms) to the Associate Head (Undergraduate Studies) within 10 business days prior to the class, test, exam, or assignment at issue.

*INSTRUCTOR INTELLECTUAL PROPERTY

Course materials created by instructors (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the instructor. These materials may NOT be reproduced, redistributed or copied without the explicit consent of the instructor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

*FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY

Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary.

*COPYRIGHT LEGISLATION

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Acceptable-Use-of-Material-Protected-by-Copyright-Policy.pdf) and requirements of the copyright act (https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html) to ensure they are aware of the consequences of unauthorised sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Non-Academic-Misconduct-Policy.pdf.

*MEDIA RECORDING (if applicable)

Please refer to the following statement on media recording of students: https://elearn.ucalgary.ca/wp-content/uploads/2020/05/Media-Recording-in-Learning-Environments-OSP_FINAL.pdf

**Media recording for lesson capture*

The instructor may use media recordings to capture the delivery of a lecture. These recordings are intended to be used for lecture capture only and will not be used for any other purpose. Although the recording device will be fixed on the Instructor, in the event that incidental student participation is recorded, the instructor will ensure that any identifiable content (video or audio) is masked, or will seek consent to include the identifiable student content to making the content available on University approved platforms.

**Media recording for self-assessment of teaching practices*

The instructor may use media recordings as a tool for self-assessment of their teaching practices. Although the recording device will be fixed on the instructor, it is possible that student participation in the course may be inadvertently captured. These recordings will be used for instructor self-assessment only and will not be used for any other purpose.

**Media recording for the assessment of student learning*

The instructor may use media recordings as part of the assessment of students. This may include but is not limited to classroom discussions, presentations, clinical practice, or skills testing that occur during the course. These recordings will be used for student assessment purposes only and will not be shared or used for any other purpose.

SEXUAL VIOLENCE POLICY

The University recognizes that all members of the University Community should be able to learn, work, teach and live in an environment where they are free from harassment, discrimination, and violence. The University of Calgary's sexual violence policy guides us in how we respond to incidents of sexual violence, including supports available to those who have experienced or witnessed sexual violence, or those who are alleged to have committed sexual violence. It provides clear response procedures and timelines, defines complex concepts, and addresses incidents that occur off-campus in certain circumstances. Please see the policy available at https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Sexual-and-Gender-Based-Violence-Policy.pdf

*OTHER IMPORTANT INFORMATION

Please visit the Registrar's website at: https://www.ucalgary.ca/registrar/registration/course-outlines for additional important information on the following:

- Wellness and Mental Health Resources
- Student Success
- Student Ombuds Office
- Student Union (SU) Information
- Graduate Students' Association (GSA) Information
- Emergency Evacuation/Assembly Points
- Safewalk

10. Statements Specific to Fall 2021

Course Format and Scheduling

Course content will be delivered through a combination of both synchronous and asynchronous learning. Students are responsible for all content covered in both types of delivery.

Lecture material and relevant links will be posted asynchronously to the course D2L site. Students may access the material at times convenient to them but should engage with the material in a timely manner in order to keep up with course deliverables. All posted material remains the intellectual property of the instructors and should not be shared or duplicated in any form.

Sections 01 - 10:

Two active learning sessions will be held in-person each week as scheduled and will provide opportunities for real-time engagement. During these sessions, instructors will review example exercises and students will participate in graded learning activities.

Section 11:

Two active learning sessions will be held online each week as scheduled and will provide opportunities for real-time engagement. During these sessions, instructors will review example exercises and students will participate in graded learning activities. Example problems and solutions may be recorded for later viewing, but in general the sessions will not be recorded to encourage open participation and discussion.

Expectations for Attendance and Engagement in Sessions

Active engagement in class and with course material is essential in any course. In a flipped classroom context, students must take increased ownership of their learning.

Expectations for attendance at synchronous sessions are the same for both in-person and online sections:

- Reviewing posted lecture material before attending
- Communicating in a professional and respectful manner at all times
- Participating fully in classroom learning activities
- Remaining masked when within 2 metres of other individuals
- Adhering to university COVID-19 response protocols

Additional expectations for Section 11:

- Keeping the microphone on mute unless called on by the instructor or teaching assistant (or participating in oral discussion)
- Using the features and tools in Zoom as requested by the instructor or teaching assistant
- If a student would like to ask a question anonymously, they may use the private chat feature in Zoom. The question will be answered publicly without attribution to the student.
- If it appears that you are not actively engaged in the class (for example, not responding to the instructor, not joining breakout rooms, etc.), your instructor reserves the right to remove you from the Zoom session. If your personal circumstances prevent you from fully participating, please speak with the instructor.

Students may use the course discussion boards to engage with their peers, teaching assistants, and instructors. Questions regarding course content should be posted to the boards rather than emailed. Emails will be responded to within two business days. Any inquiries that have already been answered via information posted to D2L will not receive a response. Emails and discussion board posts will not be monitored by the teaching assistants or instructors on weekends and holidays. Clear, professional communication is a crucial part of engineering practice. Emails should include the course name in the subject line, and your name and student ID in the body of the email. The best way to ask questions or get help on assessments is to attend your scheduled learning sessions.

Guidelines for Completing and Submitting Coursework

Content, deliverables, and deadlines will be communicated through the course D2L site and during active learning sessions. Students should check this site every weekday, as well as their associated email account. Each assessment will include guidelines that specify the submission process. Students will also be given access to an online exercise portal for autograding and feedback. Lecture content will delivered in conjunction with the required course textbook to provide interactive examples and practice opportunities.

Students may face various circumstances throughout the semester and may not feel comfortable discussing those situations with their instructor or teaching assistant. To provide flexibility in case of illness, distress, technical difficulties, etc. only the best 5/7 in-lab exercises and 10/12 video checks will count towards your final grade. No other exceptions will be considered. You must receive a passing grade on the final project to pass the course. No project extensions will be given.

If you are unable to attend an in-person synchronous session due to illness or isolation, you may either count the in-lab exercise as one of your dropped exercises, or you may participate remotely. No video or audio will be broadcast, but the examples will be released for you to work through individually. A teaching assistant will be available via chat to answer any questions regarding the content and graded exercise.