DOUGLAS COLLEGE

Course Outline

CMPT 2200: Designing with Raspberry Pi Fall 2023

Instructor: Mohammad Aboofazeli

COURSE MATERIALS

Optional Textbook: "Learn Electronics with Raspberry Pi: Physical Computing with Circuits, Sensors, Outputs, and Projects" by Stewart Watkiss, A Press, 2016, ISBN: 978-1484218976

COURSE DESCRIPTION

This course provides the student with the necessary knowledge of Raspberry Pi to design and develop practical applications. Initial emphasis will be placed on the embedded Linux OS, configuring, setting up and programming the Pi. In the latter part of the course, students will be able to apply that knowledge to case studies and projects.

COURSE OBJECTIVES

Upon the completion of this course, successful students will be able to:

- 1. Set up and operate the Raspberry Pi;
- 2. understand the basics of the Linux OS used on the Pi;
- 3. program the Pi using the programming language Python to:
 - a. access a network;
 - b. play audio;
 - c. control light-emitting diodes (LEDs);
 - d. get feedback from a switch;
 - e. get feedback from a sensor;
- 4. apply creative thinking skills in the design of practical solutions to specific case studies and projects; and
- 5. create applications that make use of electrical, computer and/or microcontroller hardware, sensor interfaces, and mechanical components.

EVALUATION

Evaluation will be carried out in accordance with Douglas College's policies. Evaluation will be based on the following criteria:

Participation/Labs: 30% Midterm examination: 30% Projects (3 projects): 40%

NOTE: A student MUST attempt at least 70% of the total weighted percentage for this course, and MUST attempt the final exam, otherwise a grade of UN will be assigned. Please refer to the appropriate pages of the current year's College Calendar for additional information on transcript grades and the grading system.

REGULATIONS

Attendance and Participation: Students are expected to attend, and actively participate in all class sessions.

Class Announcements: Students are responsible for class announcements concerning course assignment requirements, and/or schedule changes whether or not they are in attendance.

Academic Dishonesty: The Academic Dishonesty policy is available through the Douglas College website and will be the policy that is followed in this course.

Missed tests or examinations: The midterm exam will be offered ONLY during the scheduled date and time. For any exception to be arranged, the instructor must be notified BEFORE the time of the test (by e-mail to or discussion with the instructor) and only for very good reasons (i.e., medical). The instructor may request to see proof of the reason for absence.

Course Schedule

<u>Note:</u> This is the approximate course schedule. Students will be informed if any update is necessary.

Week(s)	Topics	Tests
Weeks 1-2	Introduction to Raspberry Pi (RPi), Python	
	programming, Input/Output, variables, decision	
	structures, loops, functions, lists, tuples,	
	dictionaries	
Weeks 3-4	Graphical User Interface (GUI) programming: label,	
	button, frame, entry, radio button, check button,	
	scale, and other widgets	
Week 5	Project 1	
Weeks 6-7	RPi cabling/setup/startup, Linux operating System	
	on RPi, Intro to digital electronics, electronic lab	
	equipment, controlling output devices, LEDs,	
	monitoring input devices, pushbuttons, 7-segment	
	displays	
Week 8	Midterm Exam	Midterm Exam
Weeks 9-10	Pulse Width Modulation (PWM), A/D and A/D	
	conversion, sensors	
Week 11	Project 2	
Week 12	Electric motors, Other I/O devices	
Week 13	Project 3	