



ETR 237 – Industrial Electronics

Fall 2017

Eric Bredder

Office: M821

Office Hours: T: 12-3 W: 12-4 Th: 12-3

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Meeting Time & Location: Tuesday 7:00 – 9:45, M833

Division Office: Business, Mathematics, & Technology

Course Description: Studies linear integrated circuits for industrial applications, motors, industrial control devices, power control circuits, transducers, industrial process control, and sequential process control. Part I of II.

Learning Objectives: Students in this course will understand motor control and process loops. Students will be able to identify and troubleshoot various motor types, driver circuits and passive components. Students will be able to identify and troubleshoot a variety of sensors related to process control and motor circuit design.

Grading and Evaluation: Students will be evaluated upon completion of assignments, documentation, and presentations. Grades are based on a 10-point scale.

	Percentage
Participation	10%
Documentation	25%
Labs	25%
Projects	25%
Final Project	15%
TOTAL	100%

Documentation: Students are required to document labs and projects throughout the semester. Documentation will include videos, pictures, written content that is professional and able to be published in a web format. Documentation guidelines are discussed regularly. Documentation includes theory, design,

Required Reading:

Rehg, J. A., & Sartori, G. J. (2006). *Industrial electronics*. Upper Saddle River, NJ: Pearson Prentice Hall.

Optional Books:

Horowitz, P., & Hill, W. (2008). *The art of electronics*. Cambridge: Cambridge Univ. Press.

Scherz, P., & Monk, S. (2016). *Practical electronics for inventors*. New York: McGraw Hill Education.

White, E. (2012). *Making embedded systems*. Beijing: O'Reilly.

Policy for Assignments, Papers and Projects: Students must complete assignments by due dates. Failure to do so will result in a lower grade. If you have a reason for not submitting an assignment, let the instructor know so that the situation can be handled on an individual basis.

Course Expectations Student and / or Instructor Responsibilities: Students are expected to be present on each class date unless prior, approved notice is given. Students are expected to complete all assignments to show an understanding of the material and concepts. Students agree to safely conduct themselves throughout the entirety of the course and respect the materials and tools used. Students will respect the community of learners – failure to do so will result in dismissal from class. There is zero tolerance for any negative behavior, actions, comments, or influences on learning environment.

Course Schedule: Instructor reserves the right to adjust assignments, dates, and materials throughout the semester with notice.

Date	Topic	Class	Homework
8/22	Introduction	Syllabus & Content	Photo Release Form
8/29	Process Control Loops	Block Diagrams/ Available Tools	Inkscape
9/5	Servo Control	Servo Lab w/ Arduino	Schematics
9/12	Robotic Arm	Arm Build	Documentation
9/19	Stepper Motor Control	Stepper Lab w/ Arduino	Documentation/ Drawing Machine
9/26	Stepper Project	Drawing Machine	Documentation
10/3	DC Motor Control	H-Bridges	EDA Tools
10/10	Fall Break		
10/17	Encoders & PWM	555 Timer Lab	TBD
10/24	PLC Introduction	Festo	TBD
10/31	PLC Project	TBD	Documentation
11/7	Limits/Proximity/Magnetic	Crash Cars	PCB Design
11/14	AC Motor Control/Contactors	Maintenance	TBD
11/21	Sensors	TBD	TBD
11/28	Sensors	TBD	TBD
12/5	Final Project	Work Period	TBD

Final Exams: Tuesday, December 12 – 7:00 pm – 9:45 pm
Final Projects, Review, Class Feedback

Attendance, Withdraw and Participation Policy:**Drop with Refund Date:** 9/7/17**Withdraw without Grade Penalty Date:** 10/30/17

It is the student's responsibility to drop a course. This may be done electronically by logging into MyPVCC. To obtain a refund, the course must be done by the last day to drop and qualify for a refund. To obtain a "W" grade this must be done prior to the last date to withdraw without a grade penalty. Please consult the academic calendar for these dates. <http://www.pvcc.edu/academics/academic-calendar>

Per VCCS policy, a grade of "incomplete" (I) is to be used only for verifiable unavoidable reasons when a student is unable to complete a course within the normal course time. To be eligible to receive an "I" grade, the student must (1) have satisfactorily completed more than 50% of the course requirements and (2) must request the faculty member assign the "I" grade and indicate why it is warranted.

It is the student's responsibility to request a grade of "incomplete" and initiate the process by scheduling an appointment with the faculty to discuss requirements for satisfactory course completion and consequences of failing to meet established deadlines. The official written request must be completed prior to the "grade due date" for the course. **Students who fail to complete coursework and do not request a grade of "incomplete" will receive 0 for the missed assignments and awarded a final course grade based on these calculations.**

Code of Conduct

All students are expected to abide by the Code of Conduct. Students can access the Code of Conduct and download a copy by clicking on the following link: http://www.pvcc.edu/files/media/code_of_conduct.pdf

ADA Statement (American's with Disabilities Act) If you are a student with a disability who needs classroom accommodations under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act, you are required to meet with the Disability Services Counselor, Susan Hannifan to request accommodations.

Her office is located in room M125. Phone: 961-5281, Email: shannifan@pvcc.edu
To receive academic accommodations in a timely manner for this class, please obtain the proper forms and meet with her at the beginning of the semester.

Information Technology (IT) Help Desk and Open Computer Lab

<http://www.pvcc.edu/it/>

Email: help@pvcc.edu

Tel: (434) 961-5261, room 832 [assist with SIS (Student Information System) and student email & basic computer problems]

Blackboard Support

<http://www.pvcc.edu/bbsupport>

Email: bbsupport@pvcc.edu

Academic Support Services

Tutoring, in most courses, and academic coaching are offered to all students at no additional cost.

The First Quadrant Math Center (434.961.5284) assists students in business, mathematics, sciences, and technologies.

The Writing Center (434.961-5499) aids students in humanities and social sciences, and it helps all students, regardless of subject area, with written assignments. Tutors are available on a first-come, first-served basis and by appointment.

Online tutoring is available through Smarthinking which provides on-demand, online tutoring 24 hours a day, 7 days a week, and it provides detailed, personalized critiques of written assignments within 24 hours of submission.

Academic coaching, available in the Writing Center, promotes deep learning and facilitates student success for the long haul, during and after college. Coaches help students access resources, manage priorities, prepare for exams and set goals, master active study skills.

The First Quadrant Math Center is located in M253 Main Building and The Writing Center is located in M607 Main Building. Visit <http://www.pvcc.edu/student-services/academic-support> for more information about academic support services.

Student Success Office

The Student Success Office is deeply committed to providing academic and personal support to students as they identify and achieve their educational and personal goals. When students experience difficulty in college it is often because of feeling stressed, overwhelmed, or not knowing where to turn for help. Personal issues may derail academic objectives. Please call 434.961.6581 to schedule an appointment or visit our office in room M132.

SAILS

SAILS (Student Assistance and Intervention for Learning Success) is an early alert, online resource for students. You can access SAILS through your MyPVCC account. Through SAILS, instructors can raise flags/kudos regarding your academic performance with a course. If you have questions, contact the PVCC Help Desk at 434-961-5261.

Academic Honesty Policy: [as stated in the PVCC student handbook] Piedmont Virginia Community College sets high standards for academic integrity, and takes academic dishonesty very seriously. The following misconduct is considered an honor offense and is subject to disciplinary action: cheating, plagiarism, knowingly furnishing false information to the college or instructors, and the forgery, alteration or use of college documents or instruments of identification with the intent to defraud. Students are advised that a written summary of this violation and the resulting penalty will be placed in the student's official college record. After one year of no further occurrences, the student may request that the Dean of Student Services remove the statement from the official record.

College Policies as stated in the PVCC Student Handbook

Children on Campus College facilities, including the library, cannot accommodate the care of children while parents are working or attending class. Since the college and its staff cannot be responsible for the safety and welfare of your children, you must make arrangements for them off-campus. Children may not be brought into classrooms or laboratories without permission of the instructor.

Inclement Weather Policy

PVCC remains open when primary and most secondary roads are passable. When travel to the campus is unreasonably dangerous the entire college closes. The website is the first method of notification, followed by local television stations, then local radio stations (both FM and AM).

The following phone numbers will also have delay/closing information: PVCC main phone: 434.977.3900 PVCC Inclement weather/emergency message line: 434.971.6673

Due to the unpredictable nature of Virginia's weather, PVCC may be required to close or delay opening. If a delay announcement is made, that delay is based on an 8 a.m. opening time. In the event of a delay, you should attend the class that is in progress at the time you arrive at the campus. For example, if the college is on a 2-hour delay, you would arrive at the campus at 10 a.m. to attend your 10 a.m. class (not your 8 a.m. class.)

Television Stations WVIR-TV www.nbc29.com WVAW 16 WCVA 19 WAHU 27 www.charlottesvilleneewsplex.tv/closings Radio Stations All local Charlottesville stations WKCI/WKDW/WSVO in Staunton/Waynesboro WFLO in Farmville WVTF in Roanoke

Emergency Notification PVCC uses the e2Campus emergency text and email notification system to provide quick notification in the event of an emergency, including college closings and weather related events. Users can have an emergency message sent to their cell phone or email address.

PVCC's emergency notification system will be used only for emergency messaging, college closings and class cancellations. It will not be used for general communications, and users will not be bombarded with extraneous text or email messages. There will be an occasional test of the system to ensure that it is working properly.

Register for text alerts

At: http://www.pvcc.edu/security_safety/register_for_alerts.php. (A link is also located on the PVCC home page.) This is an “opt-in” system and you can also “opt-out” of the system at any time.

Academic Disaster Planning In the event of a College-wide emergency, course requirements, classes, deadlines, and grading schemes are subject to changes that may include alternative delivery methods, alternative methods of interaction with the instructor, class materials, and/or classmates, a revised attendance policy, and a revised semester calendar and/or grading scheme.