COURSE OUTLINE
SPRING 2026

	Date	Initials
Prepared by Instructor		
Approved by Head		

1. Calendar Information

ENEL 519.62
System industrialization applied to Electrical Engineering - Group Study in Switzerland

This course aims at providing a broad context with respect to the methodological principles applicable to the design of electric and electronic systems such as the methodological principles of Design for Test (DFT). A Model based engineering approach, using Matlab, will be explored as a modern design tool for system industrialisation. The CE certification system and the international and national standardization systems to which the certification system refers, electric and electronic manufacturing standards and the different manufacturing classes with their main characteristics, specifically, the standards relating to low-voltage devices, electrical machines, and electromagnetic compatibility. Furthermore, the reliability of electronic systems and the various qualitative and quantitative methods for determining the reliability and functional safety of a system are discussed, along with some standards dealing with the functional safety of industrial systems.

Course Hours: 3 units; H(3-2)
Academic Credit: 3
Calendar Reference: https://www.ucalgary.ca/pubs/calendar/current/computer-engineering.html#31548

2. Learning Outcomes

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

1 have a basic knowledge in the fields of system inductrialisation and the Model Basel Engineering approach

2 have a basic knowledge in the fields of safety and systems engineering with a particular focus on the electronic, electrical and machinery components

2 understand the principles of development of systems under consideration of related safety and reliability aspects

4 gain the knowledge when, why and how to apply safety and reliability analysis have the principal understanding of the utilisation of system development processes in the light of safety management of systems

3. Timetable

Section	Day(s) of the Week	Time	Location
LEC 01	MTWThF	8:00-11:50, 1:00-5:00	HEFR
LAB B01	WF	1:00-5:00	HEFR

4. Course Instructors

Course Coordinator

Section	First Name	Family Name	Phone	Office	Email
L01	Svetlana	Yanushkevich	403-210-5410	ICT343	syanshk@ucalgary.ca

Other Instructors

Section	First Name	Family Name	Phone	Office	Email
L01	Ioana	Preda	41-26-429-6558	HEFR	ioana.preda@hefr.ch
L01	Frédéric	Schenker	41-26-429-6616	HEFR	frederic.schenker@hefr.ch

Teaching Assistants

Section	First Name	Family Name	Phone	Office	Email

5. Assessments

The following examinations will be held in this course:
•One midterm examination (Integrated project, May 13th, 2026)
•Final examination (May 28, 2026)
There are no other assignments, although the students might sometimes have homework. If extra work is – exceptionally – required, the students will have until the beginning of the week to hand in the requested homework.
All the individual project or homework should be handed in before the final exam. There is no additional delay possible and the students are advised to hand in their work as early as possible. In case when a student is exceptionally sick, a 4-day extension is permitted.

6. Use of Calculators in Examinations

You may use any calculator you wish for studying and completing lab reports.

7. Final Grade Determination

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

Component	Learning Outcome(s) Evaluated	Weight
Project-based report and midterm	2,4	65%
Final examination	1,3	35%

Total:	100%

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+	$T \geq 90.5\%$
A	$86.0\% \leq T < 90.5\%$
A-	$81.5\% \leq T < 86.0\%$
B+	$77.0\% \leq T < 81.5\%$
B	$72.5\% \leq T < 77.0\%$
B-	$68.0\% \leq T < 72.5\%$
C+	$63.5\% \leq T < 68.0\%$
C	$59.0\% \leq T < 63.5\%$
C-	$54.5\% \leq T < 59.0\%$
D+	$50.0\% \leq T < 54.5\%$
D	$45.5\% \leq T < 50.0\%$
F	$T < 45.5\%$

8. Textbook

No textbook is required for this course, handouts will be distributed

Title	
Author(s)	
Edition, Year	
Publisher	

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

Title	
Author(s)	
Edition, Year	
Publisher	

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 more information on the University of Calgary Student Academic Misconduct Policy and Procedure and the SSE Academic Misconduct Operating Standard, please visit: https://schulich.ucalgary.ca/current-students/undergraduate/student-resources/policies-and-procedures

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/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. Additional Course Information

Course Format and Scheduling

Course content, 56 hours (14 lectures, 6 labs, 1 project).

Major Topics:

1. Introduction to system industrialisation theory, 8h
2. System development requirements (regulatory, environmental, system) for electrical engineers, application to Model Based Engineering, 14h
3. How to develop safe and reliable systems (processes, regulations, hardware, software, documentation, certification) in the field of electrical engineering, using Model Based Engineering, 16h
4. How to apply the right safety and reliability analysis methods for electrical engineering design, 14h
5. What are reliability data bases, 4h