COURSE OUTLINE

ENEL 519.62 – Safety and Reliability Engineering

Group Study in Switzerland
Spring 2024

1. Calendar Information

Safety and Reliability Engineering

This course covers the fundamental phenomena and principles related to the occurrence of extensive electric field strengths. This knowledge is applied to the dimensioning and use of electrical power system equipment. The course includes practical training in the high-voltage laboratory regarding the generation and measurement of high voltages, component testing and safety aspects.

Course Hours: H(3-2)

Prerequisites: None.

2. Learning Outcomes

At the end of this course, students will

- have a basic knowledge in the fields of safety and systems engineering with a particular focus on the electrical, machinery and aerospace industries,
- understand the principles of development of systems under consideration of related safety and reliability aspects,
- gain the knowledge when, why and how to apply safety and reliability analysis methods to assure the design of functionally safe and reliable systems,
- have the principal understanding of the utilisation of system development processes in the light of safety management of systems.

3. Timetable

TBA

4. Course Instructors

Course Instructor

Section	Name	Phone	Office	Email
L01-L05	Dr. Wolfgang Berns	+41 26 429 67 75	ROSAS – Blue Factory Fribourg	Wolfgang.berns@hefr.ch
L06-L10	Eric Silva, MSc, MBA	+41 26 429 69 16	ROSAS – Blue Factory Fribourg	eric.silva@hefr.ch

5. Examinations

The following examinations will be held in this course:

- One midterm examinations *(Integrated project)*
- Final exam *(Oral exam)*

6. Use of Calculators in Examinations

Non-programmable scientific calculators *(without formulae storage and /or text display features) may* be used during examinations.

7. Final Grade Determination

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

Component	**Weight**
Assignments	50 %
Midterm Examination	15 %
Final Examination	35 %
TOTAL	100 %

Notes:

a) It is necessary to earn a passing grade on the final exam 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 a scale determined after the final examination has been marked. This allows the creation of a scale appropriate to the relative difficulty/easiness of the term work and the final exam. As a rough guideline, the following table shows the scale used in this course in the recent past. Please note that the scale used this year will be similar but probably not identical to scales from other years.

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-	$77.0\% \leq T < 72.5\%$
C+	$68.0\% \leq T < 72.5\%$
C	$63.5\% \leq T < 68.0\%$
C-	$59.0\% \leq T < 63.5\%$
D+	$54.5\% \leq T < 59.0\%$
D	$45.5\% \leq T < 54.5\%$
F	$T < 45.5\%$

8. Textbook

No textbook required, handouts will be distributed.

9. Course Policies

Advising Syllabus

All Schulich School of Engineering students and instructors have a responsibility to familiarize themselves with the policies described in the Schulich School of Engineering Advising Syllabus available at:

http://schulich.ucalgary.ca/undergraduate/advising

The course policies are in compliance with the general course policies at Haute école d'ingénierie et d'architecture Fribourg (HEIA-FR), Switzerland**.**

10. Additional Course Information

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

Major Topics:	Topic:		Hours
	1.	Introduction to the principles of safety and reliability engineering of systems	8
	2.	System development requirements (regulatory, environmental, system) for electrical engineers	14
	3.	How to develop safe and reliable systems (processes, regulations, hardware, software, documentation, certification) in the field of electrical engineering	14
	4.	How to apply the right safety and reliability analysis methods for electrical engineering design	14
	5.	What are reliability data bases	6