

## BE - Mini projects

### Objective of the BE

The objective of this BE is to give the opportunity to students to apply the theory studied during the Lectures, to practical issues in Reliability theory or in Actuarial sciences for instance.

More precisely, regarding the problem considered, the students are required to:

1. Present the studied mathematical framework, which matches the particular situation under interest.
2. Provide some mathematical material (and analysis) related to the objective of the problem.
3. Perform a numerical analysis of the results.
4. Give an interpretation of the theoretical and numerical results.
5. Suggest additional directions for possible future analysis.

### Agenda

The BE work is composed of:

1. Six working time slots in the Agenda (see ADE) during November and December, with special sessions:
  - (a) 1st session: kick-off meeting;
  - (b) 3rd session: half-way meeting;
  - (c) 5th session: final meeting.
2. Report deadline on **Monday December 11th, at midnight**.
3. Defense sessions on December 15th.

### Organisation

Students will work in **7 groups** composed of 3 students (and 1 of two students). Please, complete the form available at

<https://lite.framacalc.org/5modia-be-2223-9w72>

with your first names and surnames (1 line per group). Each group will be assigned one project out of the presented ones. Since the supervising manpower is limited, some project will be handled by two different groups.

#### ● Assessment:

Each group is due to:

1. Deliver on the Moodle page:
  - (a) a pdf report (written with LaTeX),
  - (b) a notebook iPython or a R Markdown containing the numerical results.
2. Perform a defense on the project.

● **Expected work:**

1. The report (written in English, approximately 10 pages long) will contain:
  - (a) A presentation of the main issue of the project.
  - (b) A description of the mathematical model associated to it.
  - (c) The theoretical treatment of the main issues.
  - (d) An interpretation of the results.
  - (e) A conclusion, including future lines of possible investigation.
2. The Notebook iPython or the R Markdown (as specified for each project) will contain in a clear way the numerical results obtained in the project.
3. The defense will be performed in English by the three members of the group (who will contribute equally). It is aimed to last 20-25 min per group (including a 15 min presentation and a 5-10 min discussion time). During the defense, students must present the main issue of the project, the main results (theoretical and numerical) together with their interpretation(s).

The supervisors encourage initiatives from the students to study additional or different questions in lines with the main topic of the project.