

Master internship "Statistics, Finance and Actuarial science"

The master internship takes place in a company or in a research laboratory. It lasts from three to six months and starts after the second semester courses, between the beginning of May and the end of October. The internship is followed by an evaluation which is credited of 14 ECTS, for the second semester. To validate the second year of the master (M2), an internship grade of at least 10/20 must be obtained. For students from partner schools (in particular Centrale-Supélec, ENSAE, ENSTA), the internship mark can be used to validate both the M2 and the third year of these schools. In this case, the specific validation rules of the school must also be followed, and it will be the student's responsibility to ensure this.

AIMS OF THE INTERNSHIP. The internship attempts to apply the lessons and skills acquired in the master's training in order to meet the needs of a company or a research laboratory. This objective aims to facilitate student integration into the professional world. The second objective, which is scientific in nature, consists in formalizing a professional problem and using relevant mathematical and numerical techniques in order to solve or better understand it. It often involves the analysis of a data file using recent statistical methods, requires bibliographic research, the understanding and implementation of techniques which extend the M2 courses.

ADVICE. Make sure that your mission is clear and that you will have data on which you will be able to conduct statistic or econometric studies and to build and test models. In other words, make sure that you will have enough material to write your internship report. When your internship has a significant operational component, negotiate with the company for having some time, for example two days a week, to do more theoretical or more innovative work. This will allow you to be close to the academic research and write a report that reaches the scientific objectives of the master. Do not forget to go to the library, to use google scholar or to ask your professors what are the academic works related to your professional problem. Comparing statistical methods on the basis of simulations or backtests is often a good way to add scientific content to an internship.

VALIDATION OF THE INTERNSHIP SUBJECT. The internship subject must be validated by an advisor, a professor of the M2, who will then sign the internship agreement and ensure follow-up of the internship.

INTERNSHIP AGREEMENT. An internship agreement must be signed before the internship begins. Except in few special cases (see below), the agreement is written by the ENSAE internship office.

INTERNSHIP REPORT A pedagogical correspondent will be assigned to each trainee. The latter must contact this advisor by email, and send him on time an electronic version of an internship report of around 30 pages. The document can be written in French or in English, and can be "confidential" if the company wishes. The latter must insist on the scientific content and the personal work carried out during the internship. It must contain in particular an abstract, an introduction, some developments, a conclusion and a list of references in alphabetical order. It may contain appendices.

CONFIDENTIALITY. In case of sensitive data the confidentiality of the report may be a legitimate requirement of the host organization, which may wish to hide data or information by, for example, replacing them by fictitious observations, or by ignoring some works. It is important to ensure that these precautions do not penalize the understanding of the carried out work and the reading of the report.

Students are supposed to be extremely vigilant regarding the information to which they have access during their internship : any negligence in this matter can lead to sanctions and prosecution. To ensure the confidentiality of the reports, they are not sent to the library or to any database (whether they are confidential or not).

For confidential reports, an explicit mention must appear on the cover page. The members of the jury are then subject to professional secrecy and undertake to keep confidential the information that they are likely to collect. For some confidential reports, the host organization may require that the report be carefully examined for validation before sending it to external parties. This procedure can take time, and the student must anticipate it. That the host organization wishes to validate the report is not an admissible reason for not respecting the date of delivery of the report.

DEFENSE AND EVALUATION. The internship defenses usually take place between October and mid-November (of the year in which the internship

takes place). Skype can possibly be used, if the student is abroad. In practical terms, the student will contact his pedagogical correspondent, to agree with a date, a schedule and a place for the defense. Members of the defense jury must receive the internship report at least one week before the defense date. The student will also inform the master' managers of the place and date of the defense. The student will book a defense room with overhead projector at ENSAE school.

The defense will begin with a presentation by the student of around 20 minutes and will continue with a question and answer session of no more than 25 minutes, in front of a jury made up of a member of the teaching team and, if possible, the tutor or another teacher-researcher. The tutor is encouraged to give his opinion on the work that has been accomplished, but will not intervene directly in the presentation, the answers to the questions and the final evaluation. The mark scale is 12 points for the report (5 for clarity and editorial quality and 7 for scientific quality), 6 points for the presentation and answers to questions, and 2 points for the assessment of the company.

PLAGIARISM. Plagiarism is a banned practice in the scientific community. Students who are guilty of this undermine the credibility of IPParis and the master program. Practices that would be recognized as forms of plagiarism (integration into reports of entire passages of articles or published works, either as is or in the form of a literal translation for example) will be very severely punished (by invalidating the internship).

SPECIAL CASES. For students from partner schools (in particular Centrale-Supélec, ENSTA and Polytechnique), the internship agreement can be drawn by their school. Internships which give rise to an actuarial dissertation will be evaluated by the French Institute of actuaries. The subject of such internships must be validated by either Caroline Hillairet or Christian Robert, who are in charge of the Actuarial track at Ensae. The internship agreement will be signed between Ensae (via its internship office) and the company hosting the intern. An internship defense will take place at the Institute of Actuaries. If necessary, to respect the deadline for the master jury, an earlier defense will be organised for the master's diploma.

In some exceptional cases, if the student is enrolled in a double cursus, the defense may be organized by the partner school, according to its own modalities. When the defense is organized by a partner school, the mark given by the M2 will include an independent evaluation of the written report, in

order to take account of the specific objectives of the master. It may therefore be different from that given by the partner school.

PENALTIES. In a certain number of cases, students may be given penalty points on their final mark :

- Non-compliance with the rules relating to the signing of internship agreements (e.g. beginning the internship without internship agreement);
- Student not appearing at his defense ;
- Non-compliance with the company's internal regulations ;
- Non-compliance of the deadline for the report delivery.