GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2023-2024

Statistical Computing (C004077)

Course size *(nominal values; actual values may depend on programme)*

Credits 6.0 **Study time 180 h**

Course offerings and teaching methods in academic year 2023-2024

A (semester 1)	English	Gent	lecture
			seminar

Lecturers in academic year 2023-2024

Storme, Veronique	WE02	lecturer-in-charge

Offered in the following programmes in 2023-2024	**crdts**	**offering**
Master of Science in Statistical Data Analysis	6	A

Teaching languages

English

Keywords

Statistical programming language SAS, Statistical Language R, principles of data management, data security

Position of the course

The global objective of this course is to provide students with a thorough basis and practical skills for the handling and management of data with accompanying information.

Contents

1 Importance of information management in general.
2 How to use data sources?
3 Introduction to (statistical) programming in SAS (SAS base/graph/stat and macro language).
4 R programming at an intermediate level.
5 Error correction, archiving, confidentiality, ethics of data handling.
6 Structuring scripts for reproducibility and cooperation with other scientists.
7 Optimizing, debugging and checking code.

Initial competences

Introductory course to statistics, introductory course to R (as required for passing the admission test).

Final competences

1 The student knows the basics of the SAS software and knows the R software at an intermediate level.
2 The student can use software to query data bases, reshape data, produce graphs, descriptive statistics and reports.
3 The student can write scripts/programs in SAS and R.
4
5 The student can contribute to a group effort for a SAS or R programming project.
6 The student can report on programming activities and can provide a summary report of a data base.
7 The student can implement good programming practices.
8 The student is aware of ethical aspects of data handling.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Group work, Seminar, Lecture, Independent work

Extra information on the teaching methods

Because of COVID19, modified forms of work can be rolled out if this proves necessary.

Learning materials and price

- Syllabus (slides and exercise material offered on UFORA)

References

- Delwiche L. D. and Slaughter S. J. (2019) The little SAS book: a primer, sixth edition. SAS Institute, Inc., Cary, NC, USA.
- SAS Certified Specialist Prep Guide: Base Programming using SAS 9.4, 2019, SAS Institute, Inc., Cary, NC, USA.
- SAS Certified Professional Prep Guide: Advanced Programming using SAS 9.4, 2019, SAS Institute, Inc., Cary, NC, USA.
- Wicklin R. (2013). Simulating data with SAS, SAS Institute, Inc., Cary, NC, USA.
- Murrell, P. (2019) R graphics. Third edition. Boca Raton: Chapman & Hall/CRC.

Course content-related study coaching

Numerous exercises are being solved during practical sessions and PC labs. Students get extra exercises that can be solved either during the practical sessions and PC labs, or at home. Students can ask questions during the PC labs and they can ask for additional feedback and exercises they made at home.
In addition, self-assessments and assignments (to be solved individually) are handed out. Students receive coaching in the process of solving the assignments followed by feedback.
For the SAS part there will also be a project to be solved in teams. Students will receive feedback & coaching.

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Written assessment open-book

Examination methods in case of periodic assessment during the second examination period

Written assessment open-book

Examination methods in case of permanent assessment

Skills test, Written assessment open-book, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

ermanent: For the SAS part there will be self-assessment exercises, a group work and a written assessment open-book with multiple choice questions. For the R-part, there will be a take home problem.
Periodical: Written examination to evaluate the extent to which students mastered the material and can actually perform analysis using the respective software packages.

Calculation of the examination mark

If the student fails for this course in the first examination period and if he/she wants a retake in the second examination period, the non-periodical evaluation will be presented in a revised form in the second examination period.
The course consists of two parts: SAS (50%) and R (50%). For R, the score depends on a take home problem (5%), and a periodical evaluation (45%). The student needs to pass for the periodical evaluation and the total score must be at least 5/10. For SAS, the score depends on the performance of the self-assessments (5%), a group work (10%), a written assessment (10%) and a periodical evaluation (25%). The student needs to pass for the periodical evaluation and the total score must be at least 5/10. The student needs to pass for both SAS and R.