# ldats2370
## 2023

# Data Management II : SAS ADVANCED PROGRAMMING

| 4.00 credits | 15.0 h + 10.0 h | Q2 |
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| Teacher(s) | Kabacinski Christophe ; |
| Language : | French |
| Place of the course | Louvain-la-Neuve |
| Prerequisites | Concepts and tools equivalent to those taught in teaching units<br>LDATS2360                           Data Management I<br>« Base SAS Programming » certificate  or equivalent knowledge.<br>Basic English comprehension (a case study presented in English will be used during the evaluations, syllabus and exercises written in English). |
| Main themes | • Utilization of the SQL language via SAS to access and write SAS tables or database tables (Oracle, Excel, MySQL…),  report creation,<br>• Utilization of the SAS Macro language  in order to automate the underlying SAS code,<br>• Introduction to SAS code optimization,<br>• Discovery of the latest SAS release : SAS Viya.<br>• Utilization of a Case Study to develop and  improve practice.<br><br>Possibility to pass the « SAS Advanced Programming » certificate (this course covers 50% of the theory, the other 50% have to be auto-discovered by the student.) [https://www.sas.com/en_be/certification/credentials/foundation-tools/advanced-programmer.html] |
| Learning outcomes | **At the end of this learning unit, the student is able to :** |
| | 1    A. Regarding the AA reference of the master in Statistics program, major "general" this activity contributes to the development and the acquisition of the following AA:<br>With priority manner : 5.3<br>With secondary manner : 1.3, 2.2, 3.3<br>Regarding the AA reference of the master in Statistics program, major "Biostatistic" this activity contributes to the development and the acquisition of the following AA:<br>With priority manner : 3.5<br>With secondary manner : 1.3, 2.2, 3.3.<br>B. Specific formulation of this activity in the program:<br>At the end of this course, the student will be familiar with different SAS advanced programming tools including the SAS macro language and SAS SQL language. He/she will moreover have an overview of the latest SAS release: SAS Viya. He/she will be able to use practically the various tools through a case study. Finally, he/she will learn 50% of the theory required to pass the  « SAS Advanced Programming » certificate. |
| Evaluation methods | The examination for this course consists of an advanced programming exercise based on a case study presented in English.  The Easter work may be included in the final assessment for 3 points provided that the points of the work are better than the points of the examination. |
| Teaching methods | The course consists of 5 X 3 hours of lectures, 5 X 2 hours of exercises. Individual work can be done by Easter. |
| Content | SAS SQL<br><br>• query and subset data<br>• summarize and present data<br>• combine tables, including complex joins and merges<br>• create and modify table views and indexes<br>• replace multiple DATA and PROC steps with one SQL query<br><br>SAS Macro<br><br>• perform text substitution in SAS code<br>• automate and customize the production of SAS code<br>• conditionally or iteratively construct SAS code<br>• use macro variables and macro functions |

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| | Introduction to SAS Optimization Technics:<br><br>• Identifying computer resources related to efficiency<br><br>SAS Viya<br><br>• Introduction to SAS Viya<br>• Loading data in SAS Viya via SAS Studio programming interface<br>• Accessing the data in other tools: Visual Analytics (VA) and Visual Data Mining and Machine Learning (VDMML)<br>• Integration of Python and R in SAS Viya |
| Inline resources | Moodle |
| Other infos | This course is born from a partnership between the UCLouvain and the SAS Institute. It is open to all students issued from a Belgian university after inscription to the academic program (master students or Phd), who succeeded the Base SAS Programming certification(or who could demonstrate an equivalent knowledge). This course is also accessible to the students of the « Certificat Universitaire en Statistique » under certain conditions. |
| Faculty or entity in charge | LSBA |

| Programmes containing this learning unit (UE) | | | | |
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| Program title | Acronym | Credits | Prerequisite | Learning outcomes |
| Master [120] in Data Science : Statistic | DATS2M | 4 | | 🔍 |
| Master [120] in Statistics: Biostatistics | BSTA2M | 4 | | 🔍 |
| Advanced Master in Quantitative Methods in the Social Sciences | LMQS2MC | 5 | | 🔍 |
| Master [120] in Statistics: General | STAT2M | 4 | | 🔍 |
| Approfondissement en statistique et sciences des données | APPSTAT | 4 | | 🔍 |
| Master [120] in Mathematical Engineering | MAP2M | 5 | | 🔍 |
| Certificat d'université : Statistique et science des données (15/30 crédits) | STAT2FC | 4 | | 🔍 |