




5.00 credits

30.0 h + 30.0 h

Q2

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| Teacher(s) | Claeys Tom ; |
| Language : | French |
| Place of the course | Louvain-la-Neuve |
| Main themes | The course places particular emphasis on modelling skills, and on solving applications and problems in Management Science using mathematical methods or formal logic. It aims to equip students with a systematic approach to analysis and problem-solving, prompting them to ask questions such as: how can this problem be expressed in quantitative terms, which model correctly represents the question put? which are the most useful tools to use? Have the application conditions been adhered to? How can the tools be used to solve the problem, how can the model be solved? What is the answer to the question first put (in the context of the initial question, not in terms of mathematical abstraction or logic) ? - Linear algebra: vectors and matrices - Determinants and matrix inversion - Linear independence and matrix rank - Eigen values and vectors - Multi-variable functions and quadratic forms Each topic is discussed using examples and using illustrations from Economics and Management Science. |
| Learning outcomes | <p>At the end of this learning unit, the student is able to :</p> <p>This mathematics course is given over to algebra and matrix calculus and Part three to optimisation and differential equations. The course has three main components and aims to teach students: " the apparatus of Mathematics (an aim which involves acquiring a whole body of knowledge). Students should be able to acquire a reasonable capacity to handle the concepts studied in the course, which are the concepts underlying the quantitative models and methods in Economic and Management Science. " How to reason in a formalised and rigorous way (a more difficult skill to acquire and one which requires practical mathematical modelling skills) " To become independent in their work and study. This course deals with mathematical formalisation in Economic, Political and Social Science in general, with particular focus on management applications. It aims to prepare students for studying specific or "state of the art", quantitative analytical and decision-making models in various fields of management.</p> |
| Evaluation methods | The evaluation will be based on a test organized during the year and the final exam which will consist of a theoretic part and a part with exercices. The exam will test the students' knowledge and understanding of the material, as well as their capability to construct solving methods. There will be open questions and multiple choice questions. |
| Teaching methods | <p>The course consists of:</p> <ul style="list-style-type: none"> • lectures: the teacher defines concepts, demonstrates results, and illustrates them with an example or an application, • exercice sessions: the teacher submits problems to the students and suggests solving methods, the students participate actively to the solution of the problems. |
| Content | <p>Contents of the cours:</p> <ul style="list-style-type: none"> • matrix calculus: vectors, matrices, determinant, linear algebra, orthogonality, eigenvalues and eigenvectors, quadratic forms, • calculus of functions of several variables: geometric description, limits, continuity, differentiability, optimisation. |
| Inline resources | https://moodleucl.uclouvain.be/course/view.php?id=10933 |
| Bibliography | Syllabus disponible via la Duc. |
| Other infos | Course entry requirements: The course does not have any entry requirements other than the knowledge acquired during a Mathematics programme of at least 4 hours per week in the final years of secondary school. |
| Faculty or entity in charge | ESPO |

| Programmes containing this learning unit (UE) | | | | |
|---|-------------------------|---------|--------------|---|
| Program title | Acronym | Credits | Prerequisite | Learning outcomes |
| Bachelor : Business Engineering | INGE1BA | 5 | |  |
| Minor in Statistics, Actuarial Sciences and Data Sciences | MINSTAT | 5 | |  |
| Master [120] in Data Science : Statistic | DATS2M | 5 | |  |