

- Faculté des sciences économiques
- [www.unine.ch/seco](http://www.unine.ch/seco)

## Programming (5AF2029)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
<b>Master en développement international des affaires</b>	<b>Cours: 2 ph</b>	Voir ci-dessous	3
<b>Master en finance</b>	<b>Cours: 2 ph</b>	Voir ci-dessous	3
<b>Master en statistique</b>	<b>Cours: 2 ph</b>	Voir ci-dessous	3
<b>Master of Science en innovation</b>	<b>Cours: 2 ph</b>	Voir ci-dessous	3

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

### Période d'enseignement:

- Semestre Printemps

### Equipe enseignante

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### Contenu

- 1) Introduction to MATLAB (operators, variables, assignment statements).
- 2) Definition and use of the main MATLAB data structures (scalars, vectors, matrices).
- 3) MATLAB Programming (selection statements, loop statements, vectorized code, scripts, functions).
- 4) Advanced MATLAB data structures (cell arrays, structures)
- 5) Plotting techniques (two-dimensional and three-dimensional plots)
- 6) Data Import and Export
- 7) Crash course in R
- 8) Crash course in Stata

Additional MATLAB material (depending on time):

- \*) Statistics and Mathematics (built-in statistical functions, matrix representation of equation systems)
- \*) Introduction to Financial Toolbox (portfolio optimisation, risk analysis)

### Forme de l'évaluation

2-hour practical evaluation during session

Re-take exam: 2-hour written exam during session.

During the practical evaluation/re-take exam:

- Only accepted documentation : course slides with annotations
- All personal connected objects (smart-phones, watches, tablets, etc. ) are forbidden. In case of violation of this rule, the students are in a situation of fraud and the unauthorized items will be removed. The exam could be deemed as failed.

During the practical evaluation:

- The use of the provided computers (from university lab) is allowed, and the solutions should be submitted in Moodle before the 2 hour deadline.

During the re-take exam:

- no computer will be provided, the solution should be written on paper.

### Documentation

Attaway, Stormy. MATLAB: A practical introduction to programming and problem solving, 5th ed., Elsevier, 2019

### Forme de l'enseignement

Mixed lectures and practical exercises in class

### Objectifs d'apprentissage

URLs	1) <a href="https://moodle.unine.ch/course/view.php?id=3844">https://moodle.unine.ch/course/view.php?id=3844</a>
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### **Programming (5AF2029)**

Au terme de la formation l'étudiant-e doit être capable de :

- Identify the basic concepts of structured programming
- Use basic data structures
- Select appropriate algorithmic approaches to solve problems
- Develop simple solutions for managing data in the context of research applications
- Develop basic programs to manipulate and analyse data
- Justify the steps necessary for solving a problem
- Explain the algorithm solving strategy
- Analyse simple algorithms
- Explore additional documentation for solving a specific problem in an independent manner

#### **Compétences transférables**

- Apply knowledge to new situations
- Design projects
- Discuss complex issues