Computer Science

Mathematical Methods, Algorithmics and Implementations (COMP0112)

**Description**

**Aims:**
To provide a rigorous mathematical approach: in particular to define standard notations for consistent usage in other modules. To present relevant theories and results. To develop algorithmic approach from mathematical formulation through to hardware implications.

**Learning outcomes:**
On successful completion of the module, a student will be able to:
1. understand analytical and numerical methods for image processing, graphics and image reconstruction;

**Content:**
Linear Algebra via Geometry:
- Vectors and matrices;
- Eigenvalues;
- Kernel spaces;
- Singular value decomposition;
- Coordinate systems;

Probability and Estimation:
- Forward probability;
- Common probability distributions;
- Moments;
- Inverse probability;
- Bayes Theorem;
- Maximum likelihood estimation;
- Calculus;

Optimization:
- Gradient Descent;
- Gauss-Newton;

**Key information**

**Year** 2019/20
**Credit value** 15 (150 study hours)
**Delivery** PGT L7, Campus-based
**Reading List** [View on UCL website](https://www.ucl.ac.uk)
**Tutor** Dr Bangti Jin
**Term** Term 1
**Timetable** [View on UCL website](https://www.ucl.ac.uk)

**Assessment**

- Written examination (main exam period): 75%
- Coursework: 8%
- Coursework: 8%
- Coursework: 9%

**Find out more**

For more information about the department, programmes, relevant open days and to browse other modules, visit [ucl.ac.uk](http://ucl.ac.uk)

**Disclaimer:** All information correct as of August 2019. Please note that aspects of the module may be subject to change. UCL will make best efforts to inform applicants of major changes.
Descriptive

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Requisites:
In order to be eligible to select this module, a student must be registered on a programme for which it is formally available.

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