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]

**Tutor** Dr Bangti Jin

**Term** Term 1

**Timetable** [View on UCL website]

**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 June 2019. Please note that aspects of the module may be subject to change. UCL will make best efforts to inform applicants of major changes.
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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.

**Key information**

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