# Mathematics for Economics II

<table>
<thead>
<tr>
<th><strong>Semester</strong></th>
<th>SPRING 2016</th>
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<tbody>
<tr>
<td><strong>Class code</strong></td>
<td>MATH-UA9211002</td>
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Room 756, Birkbeck, University of London, School of Economics, Mathematics and Statistics London WC1E 7HX

<table>
<thead>
<tr>
<th><strong>Class Details</strong></th>
<th>Mathematics for Economics II</th>
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<tbody>
<tr>
<td>Location</td>
<td>10am – 1pm. Tuesdays.</td>
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<td></td>
<td>Location to be confirmed.</td>
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| **Prerequisites** | Mathematics for Economics I |

| **Class Description** | The course will provide the student with a clear exposition of the essential mathematical tools from calculus of several variables and linear algebra to solve problems arising in economics. The course will be delivered by traditional “chalk and talk” lectures and supplemented with regular take home assignments. |

| **Desired Outcomes** | To employ the Lagrange technique for optimizing functions subject to simple linear constraints. To master the basic theory of linear algebra, specifically focusing on operation on vectors and matrices. An introduction to integration and its applications. To be able to solve simple differential equations which have their focus on topics in economics (compunt interest and population models). |

<table>
<thead>
<tr>
<th><strong>Assessment Components</strong></th>
<th>Assignments 30% Midterm 20% Final 50%</th>
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<tbody>
<tr>
<td></td>
<td>Failure to submit or fulfil any required course component results in failure of the class.</td>
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| **Assessment Expectations** | **Grade A:** Thorough understanding of both theory and its applications. **Grade B:** A good understanding of the theory and confidence in its applications. |
**Grade C:** A good understanding of the theory and reasonable competence in its applications.

**Grade D:** A reasonable understanding of both theory and applications.

**Grade F:** An inability to master both the theory and its applications to an acceptable level.

**Required Text(s)**


**Supplemental Text(s) (not required to purchase as copies are in NYU-L Library)**

| Lectures will be self-contained however for lots of worked examples and a less theoretical approach you can consider: Mathematics for Economics and Business (7th Edition) by Ian Jacques. ISBN 978-0273763567. |
| To explore the subject in greater mathematical depth you can consider: Mathematics for Economists by Carl Simon and Lawrence Blume ISBN 978-0393117523 |

**Internet Research Guidelines**

None

**Additional Required Equipment**

Pen and paper.

**Session 1**

| 02-02-2016 |
| No Assignment |

**Session 2**

| Constrained optimization by substitution and by the Lagrange method. |
| 09-02-2016 |
| Assignment 1 set (due 16-02-2016) |

**Session 3**

| Applications to Economics |
| 16-02-2016 |
| Assignment 2 set (due 23-02-2016) |

**Session 4**

| Linear Algebra, systems of linear equations, Gaussian elimination. |
| [23-02-2016] |
| Assignment 3 set (due 01-03-2016) |

**Session 5**

<p>| Matrices and Matrix operations. Determinants and inversion of matrices. Cramer’s rule |</p>
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>01-03-2016</td>
<td>Assignment 4 set (due 08-03-2016)</td>
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<tr>
<td>08-03-2016</td>
<td>Assignment 5 set (due 15-03-2016)</td>
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<tr>
<td>08-03-2016</td>
<td><strong>Session 6</strong> Characteristic equations and finding Eigenvalues.</td>
</tr>
<tr>
<td>15-03-2016</td>
<td>Review for mid term</td>
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<tr>
<td>15-03-2016</td>
<td>No assignment</td>
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<tr>
<td>12-03-2016</td>
<td><strong>Session 7</strong> Review for mid term</td>
</tr>
<tr>
<td>15-03-2016</td>
<td>No assignment</td>
</tr>
<tr>
<td>22-03-2016</td>
<td><strong>Session 8</strong> Mid-term test. Two hour in duration.</td>
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<tr>
<td>22-03-2016</td>
<td>No assignment</td>
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<tr>
<td>05-04-2016</td>
<td><strong>Session 9</strong> Introduction to integration. Area under curve.</td>
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<tr>
<td>05-04-2016</td>
<td>Left and right Riemann sums. Evaluation of definite integrals.</td>
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<tr>
<td>05-04-2016</td>
<td>Assignment 6 set (due 12-04-2016)</td>
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<tr>
<td>12-04-2016</td>
<td><strong>Session 10</strong> Fundamental theorem of calculus. Applications of</td>
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<tr>
<td>12-04-2016</td>
<td>integration to economics.</td>
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<tr>
<td>12-04-2016</td>
<td>Assignment 7 set (due 19-04-2016)</td>
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<tr>
<td>19-04-2016</td>
<td><strong>Session 11</strong> Integration techniques continued..</td>
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<td>19-04-2016</td>
<td>Assignment 8 set (due 26-04-2016)</td>
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<tr>
<td>22-04-2016</td>
<td><strong>Session 12</strong> Multiple integrals – change of variables.</td>
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<td>22-04-2016</td>
<td>Assignment 9 set (due 03-05-2016)</td>
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<tr>
<td>03-05-2016</td>
<td><strong>Session 13</strong> Differential equations of order one.</td>
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<tr>
<td>03-05-2016</td>
<td>Assignment 10 set (due 10-05-2016)</td>
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<tr>
<td>10-05-2016</td>
<td><strong>Session 14</strong> Review of Topics. A retrospective of the entire course.</td>
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<tr>
<td>10-05-2016</td>
<td>No assignment.</td>
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<tr>
<td>10-05-2016</td>
<td><strong>Session 15</strong> Final Exam. 2 hour exam covering the entire course.</td>
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**NYU LONDON ACADEMIC POLICIES**

**Academic Integrity**
At NYU, a commitment to excellence, fairness, honesty, and respect within and outside the classroom is essential to maintaining the integrity of our community. By accepting membership in this community, students take responsibility for demonstrating these values in their own conduct and for recognizing and supporting these values in others.

At NYU London, students will submit electronic copies of their written work to Turnitin via their NYU Classes course site. Instructions will be provided to you separately.

**Late Submission of Work**
Written work due in class must be submitted during the class time to the professor. Late work should be submitted in person to a member of NYU London staff in the Academic Office (Room 308, 6 Bedford Square) during office hours (Mon – Fri, 10:30 – 17:30). Please also send an electronic copy to academics@nyu.ac.uk for submission to Turnitin.

Work submitted within 5 weekdays after the submission time without an agreed extension receives a penalty of 10 points on the 100 point scale.

Written work submitted more than 5 weekdays after the submission date without an agreed extension fails and is given a zero.

**Please note** end of semester essays must be submitted on time.

**Attendance Policy**
Study abroad at Global Academic Centres is an academically intensive and immersive experience. Learning in such an environment depends on the active participation of all students. As classes typically meet once a week, even a single absence can cause a student to miss a significant portion of a course.

To ensure the integrity of this academic experience, class attendance is mandatory and unexcused absences will be penalized with a two percent deduction from the student’s final course grade. Students are responsible for making up any work missed due to absence. Repeated absences in a course may result in failure.
How to report an absence

Absences from class must be reported to NYU London administrative staff using the online Absence Form:
http://tinyurl.com/nyulabsence

Absences can ONLY be excused if they are reported using this form. Students should NOT approach their class instructor for an excused absence. However, students should contact their class instructor to catch up on missed work.

Medical absences
If you are unable to attend a class due to ill-health, you must provide details of your illness and class(es) missed to NYUL staff using the online Absence Form WITHIN SEVEN DAYS of your return to class.

Please do not use the form to report a medical emergency or to request urgent assistance. In a medical emergency call 999 and ask for an ambulance. NYU London staff are available to offer support, whatever time of day. If you would like to speak to a member of staff urgently to request support with a medical problem, please call 0800 316 0469, selecting option 2.

Non-medical absences
If you have to miss class for an unavoidable, non-medical reason you must provide details to NYUL staff using the online Absence Form AT LEAST SEVEN DAYS PRIOR to the date(s) in question. Examples of valid non-medical reasons are as follows: religious holiday; family wedding; scholarship competition; family emergency. If in doubt please speak to a member of Academics staff or email academics@nyu.ac.uk. Failure to provide requested documentation for these types of absences will result in the absence remaining unexcused.

Further information regarding absences

NYU London staff carefully monitor student attendance and absence records. In most cases full completion of the online Absence Form will be sufficient to excuse your absence. However, in certain circumstances, you will be asked to provide additional information/verification before it can be excused. If we notice that you have multiple absences you will be contacted to arrange a meeting with a member of staff.

Unexcused absences from exams are not permitted and will result in failure of the exam. Students may not take an exam before or after other students in the class, and may not leave the programme before all course work has been submitted.

Please refer to the NYU Wikis Page for the full absence policy: https://wikis.nyu.edu/x/awRgAw

Grade conversion

NYU in London uses the following scale of numerical equivalents to letter grades:

A=94-100
A-=90-93
B+=87-89
B=84-86
B-=80-83
C+=77-79
C=74-76
C-=70-73
D+=67-69
D=65-66
F=below 65

Where no specific numerical equivalent is assigned to a letter grade by the class teacher, the midpoint of the range will be used in calculating the final class grade (except in the A range, where 95.5 will be used).
Grading Policy

NYU in London aims to have grading standards and results in all its courses similar to those that prevail at Washington Square.