Math 4 Suggested Syllabus

**Text:** *Mathematics for Economics*, Hoy, Livernois, et.al, Custom Edition

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| **Lecture** | **Section** | **Topic** |
| 1 | 7.1 |  Solving Systems of Linear Equations |
| 2 | 7.2 | Linear Systems in 3 variables |
| 3 | 7.2 | Linear Systems in n-variables |
| 4 | 8.1,8.2 |  General Notation of Matrices, Basic Matrix Operations |
| 5 | 8.2 | Basic Matrix Operations |
| 6 | 8.3,8.4 | Matrix Transposition, Special Matrices |
| 7 | 9.1 | Defining the Inverse, 2x2 case |
| 8 | 9.2 | Determinants of 3 by 3 Matrix |
| 9 | 9.2 | Determinants of n by n Matrix and its Properties |
| 10 | 9.3 | Inverse of n by n Matrix |
| 11 | 9.4 | Cramer’s Rule |
| 12 | 10.1 | Vector Spaces, Linear Independence |
| 13 | 10.1 | Vector Spaces, Rank of a Matrix |
| 14 | 10.2 |  Eigenvalue Problem, 2x2 Matrices  |
| 15 | 10.2 | Eigenvalue Problem, 3x3 Matrices |
| 16 |  10.3 | Quadratic Forms, Positive/Negative Definite Matrices |
| 17 |  | Review |
| 18 |  | **Midterm** |
| 19 | 11.1 | Partial Differentiation, Gradient |
| 20 | 11.2 | Level Sets, Second-order Partial Derivatives, Hessian |
| 21 | 11.3 | First-Order Total Differential |
| 22 | 11.3 |  Slope of a Level Set, MRTS and MRS |
| 23 | 11.3,12.1 | Slope of function of 3 variables. Optimization- First-order conditions |
| 24 | 12.1,12.2 |  Optimization- First-order conditions and Second order conditions |
| 25 | 12.2, 12.3 | Second-order conditions, Direct Restrictions on Variables |
| 26 | 12.3 | Direct Restrictions on Variables |
| 27 | 13.1 |  Constrained Problems and Approaches to Solutions, La Grange Multipliers |
| 28 | 13.1 | Constrained Problems and Approaches to Solutions, La Grange Multipliers |
| 29 |  | Review |
| 30 |  | **Final Exam** |
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