數學系課程核心教材內容

<table>
<tr><td colspan="4">課程名稱：(中文）線性代數(二)
(英文）Linear Algebra(II)</td><td>開課單位</td><td>學士班</td></tr>
<tr><td colspan="4"></td><td>課程代碼</td><td>2101012</td></tr>
<tr><td>學分數</td><td>3</td><td>必/選修</td><td>必修</td><td>開課年級</td><td>一</td></tr>
<tr><td colspan="6">教學目標：
線性代數不僅是數學系的基礎科目，也同時是其他領域中解決問題的重要工具。故本課程之教學目標是希望學生能熟諳基本知識、充分理解基本觀念且嫻熟處理問題的基本技巧，並用具體的例子闡述線性代數的理論。

課程概述：特徵值、特徵向量、線性變換、內積空間、Jordan form。

先修科目或先備能力：Algebra, analytic geometry, and trigonometry.</td></tr>
<tr><td>建議參考書目</td><td colspan="5">1. “Elementary Linear Algebra with Applications (9th edition)”, by Howard Anton and Chris Rorres.
2. “Introduction to Linear Algebra (4th edition)”, by Gilbert Strang.
3. “Linear Algebra (4th edition)”, by Stephen H. Friedberg, Arnold J. Insel, and Lawrence E. Spence.</td></tr>
</table>

課程大綱

單元主題	內容綱要	上課週數
Eigenvalues and Eigenvectors	Diagonalizations, linear dynamical systems, similarity	3-4
Linea transformations	Kernel and range of linear transformation, matrix representation of linear transformations, change of basis	3-4
Inner Product Spaces	Norm, orthogonal sets, Gram-Schmidt process, Q-R decompositions, orthogonal complements, etc.	3-4
Jordan Canonical Form (optional topics)	Invariant subspaces, direct sums, spectral theorem	3-4