MAT240 LECTURE 17 10/5/14

V/F w/ basis $\beta = (v_1, \ldots v_n)$
W/F w/ basis $\delta = (w_1, \ldots w_m)$.

$$\mathcal{L}(V,W) \xrightarrow{\text{iso}} M_{m\times n}(F)$$

$$T \longmapsto [T]^{\delta}_{\beta} = A$$

$$A = \left(\begin{array}{c|c|c} a_{11} & & \\ [Tv_1]_\delta & [Tv_2]_\delta & \cdots \\ a_{m1} & & \end{array} \right)$$

$$\iff Tv_j = \sum_{i=1}^{m} a_{ij} w_i$$

0. $[0]^{\delta}_{\beta} = 0$

1. $V = W \quad \beta = \delta \quad I : V \to V$

$$[I]^{\beta}_{\beta} = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} = I = I_n \quad \text{(the } n\times n \text{ identity matrix)}$$

$Iv_1 = v_1 = 1v_1 + 0v_2 + \cdots + 0v_n$
$Iv_2 = v_2 = 0v_1 + 1v_2 + 0v_3 + \cdots + 0v_n$