$V = \{f: \Omega \to \mathbb{R}\}$

$\Big\downarrow$

$(V,+,\cdot)$ VEKTOR SPACE

$\Big\downarrow$ $L^p(\Omega) = \{f: \Omega \to \mathbb{R} \mid \int_\Omega |f|^p(\vec{x})\, d^n\vec{x} < \infty\}, \quad 1 \le p < \infty$

$L^p(\Omega)$ .. SUBSPACE OF V

$\Big\downarrow$

$(L^p(\Omega),+,\cdot)$ ... VECTOR SPACE

$\Big\downarrow$ $\|f\|_p = \left(\int_\Omega |f|^p(\vec{x})\, d^n\vec{x} \right)^{1/p}$

$(L^p(\Omega),+,\cdot)$ ... NORMED VECTOR SPACE

$\xrightarrow{f,g \in L^p(\Omega)}$ $\|f+g\|_p \le \|f\|_p + \|g\|_p$

$\Big\downarrow$

$\|f\|_p = 0$

$\Updownarrow$

$f \equiv 0$ A.E

$\Big\downarrow$

EQUIVALENCE CLASSES

$\xrightarrow{p=2}$ $\langle f,g \rangle = \int fg(\vec{x})\, d^n\vec{x} \quad (f,g \in L^2(\Omega))$

INNER PRODUCT

$\Big\downarrow$

$(L^2(\Omega),+,\cdot)$ ... INNER PRODUCT SPACE

$\|f\|_2 = \sqrt{\langle f,f \rangle}$

$L^\infty(\Omega) = \{f: \Omega \to \mathbb{R}$ MEASURABLE $\mid \text{ess-sup}(|f|) < \infty\}$

$\|f\|_\infty = \text{ess-sup}(|f|)$