

ECE-314, Fall 2008
Signals and Systems

Evaluating the Convolution Integral:

The convolution integral for evaluating the output of a LTI system is:

$$y(t) = \int_{-\infty}^{\infty} h(\tau) x(t-\tau) d\tau$$

This can be interpreted as the area under the product $h(\tau) x(t-\tau)$ for $t \in \mathbb{R}'$. Towards evaluating this integral:

- (a) We require a reflection of the input $x(\tau)$, i.e., $x(-\tau)$
- (b) We perform a shift of the reflected input by $t \in \mathbb{R}'$, i.e., $x(-\tau+t)$, $t \in \mathbb{R}'$
- (c) We then evaluate the product $h(\tau) x(t-\tau)$ and the area under the product for $t \in \mathbb{R}'$
- (d) In some cases evaluation of the integral may not be needed.