Abstract:

We consider a Hilbert space of functions analytic in a domain in $C^N$, for example, the Hardy Hilbert space on the unit disk, $H^2(D)$. If $\psi$ is a complex valued function on the domain and $\varphi$ is an analytic map of the domain into itself, the weighted composition operator $W_{\psi,\varphi}$ is defined by

\[(W_{\psi,\varphi}f)(z) = \psi(z)f(\varphi(z))\]

for $z$ in the domain and $f$ a function from the Hilbert space.

Over the past three decades, it has become increasingly apparent that weighted composition operators arise in important ways in a variety of contexts. For example, in 1964, Frank Forelli showed that every isometry of $H^p(D)$, for $1 < p < \infty$ but $p \neq 2$, is a weighted composition operator.

This talk will describe results from the thesis of Gajath Gunatillake on basic properties of weighted composition operators, specifically on questions of boundedness, compactness, and spectra of compact weighted composition operators. Finally, work of Eung Il Ko and the speaker on a special class of weighted composition operators on $H^2(D)$ will be presented.