Abstract
One of the main themes in number theory can be summarized as follows: Given a number theoretic object $X$ of interest, one can define an associated complex analytic function $L(s,X)$ by using only "local" data about $X$. One can then study this $L$-function using complex analysis to arrive at amazing theorems and conjectures about $X$. I will explain such a conjectural relationship about elliptic curves in the undergraduate talk. I will begin this talk by stating a theorem along these lines in the case $X$ is a number field and then recalling the statement about elliptic curves. I will then focus on a generalization of this conjecture to the setting of modular forms and what can be said in this setting.