Auburn University Montgomery

Department of Mathematics

Colloquium/$\mathcal{MAMS}$

Time: Wednesday, April 19, 2006, 4:00pm

Place: Auburn University Montgomery, Goodwyn Hall, Room 202

Speaker: Edith Adan-Bante, University of Southern Mississippi, Gulf Coast

Title: On Finite Groups

Abstract:

A finite group is a group G where the underlying set is finite. The conjugacy class of $a \in G$ is the set $a^G = \{g^{-1}ag \mid g \in G\}$ of all conjugates of a in G. Conjugacy classes are important subsets of a group. For instance, a subgroup N of G is normal if and only if for any $a \in N$, the conjugacy class a^G is a subset of N. Let $[a, G] = \{a^{-1}a^g \mid g \in G\}$. We can check that $a^G = a[a, G]$ and thus $|a^G| = |[a, G]|$.

Let a^G and b^G be conjugacy classes of G and $a^G b^G = \{xy \mid x \in a^G, y \in b^G\}$ be the product of a^G and b^G. We can check that $a^G b^G$ is a G-invariant subset of G, that is $(xy)^g \in a^G b^G$ for any $xy \in a^G b^G$ and any $g \in G$. Also, we can check that because $a^G b^G$ is a G-invariant subset of G, then $a^G b^G$ is the union of n distinct conjugacy classes G, for some integer n, and the conjugacy class $(ab)^G$ is a subset of $a^G b^G$. Set $n = \eta(a^G b^G)$.

In this talk we address the following issue: Under what circumstances is $a^G b^G$ also a conjugacy class, i.e. $\eta(a^G b^G) = 1$?

****Refreshments will be served at 3:45pm****