Dr. Rao Bhaskara
Phillips Professor of Mathematics
Southwestern College

"Solving Linear Equations
Generalized Inverses of Matrices"

Abstract:

A matrix $G$ is called a generalized inverse of a matrix $A$ if $AGA = A$.

Generalized inverse of a matrix is useful in finding solutions of consistent system of equations and also in deciding whether a system of equations is consistent. If $G$ is a generalized inverse of $A$ and if we want to find a solution of $A\vec{x} = \vec{a}$ and if we know that $A\vec{x} = \vec{a}$ is consistent then $\vec{x} = G\vec{a}$ is a solution (just as in the case of inverse).

Every matrix has a generalized inverse.

The above results are all well known and hold good for real matrices.

What can we say about integer matrices? What can we say about matrices over polynomials in one variable? More generally, what can we say about matrices over an associative ring? These questions are significant in solving systems of equations involving integers or polynomials.

For example, not every integer matrix has an integer generalized inverse matrix. We shall characterize all those integer matrices that have integer generalized inverse matrices. We shall give a brief picture of the present state of this subject and pose several problems.

Friday, February 8, 2002
3:00 PM in 335 Jabara Hall

Please come join us for refreshments before the lecture at 2:30 p.m. in room 353 Jabara Hall.