Abstract:
A combinatorial design is a pair \((V,B)\), where \(V\) is a set of, say \(v\) points, and \(B\) is a collection of subsets of \(V\). Many different designs may be defined depending on what type of properties we impose mainly on \(B\) and on \(V\). First we will define one of the most commonly and applicable designs, called balanced incomplete block designs and see an application. Then we will define a t-design and group divisible designs and discuss an application.

Combinatorial Design Theory is one of the challenging, exciting, fertile and unsaturated area of Mathematics with many applications and open problems. As is true in general with Combinatorics, Combinatorial design theory problems are easy to explain, but the solutions may be very hard to find and require many techniques from different areas of mathematics as well as a good insight into the structure of these designs.

Recently we used the concepts of a t-design and a group divisible design (GDD) to define a 3-GDD with indices \(\lambda_1\) and \(\lambda_2\) and proved that the necessary conditions are sufficient for the existence of 3-GDDs with block size 4 except when \(n \equiv 1, 3 \pmod{6}\) and \(\lambda_1 > \lambda_2\). We will review what has been done and show how we can apply large sets and t-designs to construct 3-GDDs when \(n \equiv 1, 3 \pmod{6}\) and \(\lambda_1 > \lambda_2\).

The talk contains joint work with Wilbard Bezire and ongoing work with William Cowden.

Friday, April 20, 2018
3:00 PM in 372 Jabara Hall

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