

Differential Forms and Applications.

Tentative Schedule: July 6-July 16, M/T/W/R 1:00 pm-3:00 pm at Boyd 326.

Description:

Differentiable manifolds are essential in many parts of geometry and topology, and the course I will be offering this summer intends to be a friendly introduction to this topic via the tool of differential forms. Most of the course will focus on extending the methods of differential calculus to the setting of differentiable manifolds. We will do this in various concrete ways, for instance, surfaces in three-space and Riemann surfaces will serve as inspiring examples.

Topics to be covered may include:

- (1) Differential forms in \mathbb{R}^2 and \mathbb{R}^3 ,
- (2) Line integrals,
- (3) Introduction to differentiable manifolds,
- (4) Integration on manifolds, and
- (5) Geometry of differentiable surfaces and Riemann surfaces.

A few useful references:

- (1) Global Analysis - Differential Forms in Analysis, Geometry and Physics, by I. Agricola and T. Friedrich,
- (2) Differential Forms and Applications, by P. do Carmo,
- (3) Lectures on Riemann Surfaces, by O. Forster, and
- (4) Introduction to Riemann Surfaces, by G. Springer.