

MAT 800

TOPICS IN ANALYSIS – VARIATIONAL ENERGY INTEGRALS

Spring 2015

COURSE INFORMATION

Instructor: *Tadeusz Iwaniec*

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Office Hours: Tuesday 1:00 - 2:00 pm
Thursday 1:00 – 2:00 pm
At other times by appointment

Classes: TTh 2:00 -- 3:20 Carnegie Building 120

Text: Notes will be provided during the course

Prerequisites: I will assume some knowledge of Measure Theory, integration, Calculus in Several Variables and basics in Functional Analysis.

Course Description: We will cover the following topics:

Elements of Sobolev Theory (review)
-distributions
-definitions of Sobolev spaces
-embedding theorems

Jacobian Determinants

Direct Method in the Calculus of Variations

Mathematical Models of Nonlinear Elasticity

Null Lagrangians

Polyconvex Variational Integrals

Free Lagrangians

Energy-Minimal Deformations of Annuli

Mappings of Smallest Mean Distortion

Monotone Sobolev Mappings

To make these lectures available to students whose mathematical knowledge may be limited, every effort will be made to reduce to a minimum the technical complications and mathematical requirements. No prior exposure to these topics is assumed. You are invited to pursue the exercises given occasionally during the course. Some of them are far from routine.

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