TEXAS STATE UNIVERSITY

The rising STAR *of Texas*

Differential Equations and Applied Math Seminar

Dr. Ray Treinen, Texas State University

11am-12pm November 13th, 2020

Zoom

Title: Theory and applications of representing certain functionals with integrals, part V

Abstract: We will continue to discuss results from a paper by Buttazzo and Dal Maso. In this week's seminar we will prove the following:

Theorem. *For every functional* $F : W^{1,p} \times \mathcal{B} \to \mathbb{R}$, $1 \leq p \leq \infty$, *the following conditions are equivalent:*

1. *there exists an integrand* $f \in Car_p$ *such that*

$$F(u, B) = \int_B f(x, u(x), Du(x))\, dx,$$

for every $u \in W^{1,p}$ *and every* $B \in \mathcal{B}$,

2. F *is local on* $\mathcal{A}$, *is a measure, is p-bounded, satisfies the strong condition* (ω), *and for every* $A \in \mathcal{A}$ *the function* $u \mapsto F(u, A)$ *is strongly lower semicontinuous on* $W^{1,p}$ *(*$\tau_\infty-$ *lower semicontinuous on* $W^{1,\infty}$ *in the case* $p = \infty$*).*

We will discuss some preliminary results for next week as well.
Interested faculty and graduate students are encouraged to attend.