Math 742 - Geometric Analysis                                 Fall 2021
Lectures: TuTh, 12:30 - 2:00 PM, MTH B0431

**Instructor Information:**

Dan Cristofaro-Gardiner                    Office Hours: by appointment

**Course Description**:

This is a one quarter, graduate-level course on Geometric Analysis. This is an extremely rich topic, and I hope we have a great time exploring it. The main goal of the course will be to illustrate some standard elements of the theory by exploring in depth the details behind some beautiful applications.

**Prerequisites:**

The formal prerequisites for the course are either MATH673 and MATH674 (Partial Differential Equations 1 and 2); or MATH740 (Riemannian geometry). If you have not fulfilled the prerequisites and still want to take the class, or are at all worried about your background for the class, I urge you to contact me as soon as possible and we can set up a time to meet and discuss.

**Textbooks**:

We will be using a variety of sources for the class, with an emphasis on sources that are available for free online-

- Many handouts (see webpage) as appropriate

- *Elliptic operators, topology and asymptotic methods*, Roe

- *Partial Differential Equations,* Evans

- *Geometric measure theory: a beginner's guide, third edition*, Morgan

- *Notes on Seiberg-Witten theory,* Noicolescu

- *Lectures on Holomorphic Curves in Symplectic and Contact Geometry,* Wendl (time permitting)

**Email and Website**:

There is a website for this course, at https://dancg.sites.ucsc.edu/teaching/math-742-geometric-analysis/. I will periodically post very short lecture summaries there. I will also post clarifying notes from time to time.  If many students ask me a similar question, I will post a response there.

You are highly encouraged to email me with any questions that you might have. I will try to respond to all emails with 48 hours.

**Grading:**

You will have to write a short paper for this class. (I can help you find a topic.)  There will be optional homework exercises as well.

**Advice for you**:

To get the most out of this course, I highly suggest that you do some of the optional exercises. I will provide suggestions of good problems to do throughout the course.  You are also encouraged to ask lots of questions!

**A note on flexibility**:

As this is a small graduate course, we have some flexibility to tailor the lectures to student needs. If there is something you would like to hear about, please let me know!