Course Info:
Math 653 - Introductory Analysis
Fall 2016 - Section 001

Time/Place:
Tu, Th: 2:00 PM - 3:15 PM - 228 Phillips Hall

Instructor:
Jeremy Louis Marzuola

Contact Info:
E-mail: marzuola@math.unc.edu
Office: Room 324D Phillips Hall
Office Hours: My office hours (tentatively depending upon student schedules) are Tuesday 3:30-4:30, Wednesday 2:30-3:30 and Thursday 3:30-4:30 in Phillips Hall 324D.

Course Description:

1. Metric Spaces (4 weeks)
   Open sets, compactness, completeness, connectedness
   Normed spaces of continuous functions, uniform convergence
   Differentiation and integration of sequences and series of functions
   Contraction mapping theorem
   ODE existence theorem

2. Differentiable Mappings (5 weeks)
   Derivative as a linear map
   Continuous differentiability, chain rule
   Higher derivatives, Taylor’s theorem with remainder
   Classifying critical points
   Inverse and implicit function theorems
   Applications to local coordinates on surfaces

3. Measure Theory (5 weeks)
   Properties of measures, Lebesgue measure
   Integration on measure spaces
   Convergence theorems: monotone convergence, dominated convergence, Fatou
   L1 spaces, as complete normed linear spaces

Required Course Text:
T. Tao, Analysis II.

Recommended Course Texts:
H.L. Royden, Real Analysis.
W. Rudin, Principles of Real Analysis.
E. Lieb and M. Loss, Analysis.
Grading:
Grades will be based on weekly homework assignments (25%), two mid-term exams (20%) and a Final Exam (35%).

Scheduling:
Holidays for the Fall 2016 are on October 20th and November 24th, 2016. The final day of classes is Tuesday, December 6th. The Final Exam for the course is scheduled as per the Registrar’s Office for Saturday, December 10th at 12 PM.

Disclaimer:
If necessary, modifications to the schedule and grading may be made throughout the semester at the discretion of the instructor.