MA641: Differential Geometry

Spring 2014

Instructor	P. D. Hislop
Office:	753 POT 7-5637 or peter.hislop@uky.edu
Text:	M. P. do Carmo: *Riemannian Geometry* Birkhäuser Boston 1992.
Class Meetings:	MWF 10:00–10:50 AM CB 231
Course web page:	http://www.ms.uky.edu/ hislop/
Office Hours:	M 3-4; W 4-5; and feel free to stop by or email me.

Course Topics

Our goal will be to cover the first nine chapters of do Carmo's book *Riemannian Geometry*, Chapters 0–4. We will study differentiable manifolds, and structures on these manifolds. I plan to emphasize basic examples throughout the course. The big topics are:

1. Differentiable manifolds
2. Riemannian Metrics
3. Connections
4. Geodesics
5. Curvature

Once we cover these, we will look at two advanced topics: Chapter 7 on complete manifolds and the Hopf-Rinow Theorem, and Chapter 8 on spaces of constant curvature.

Course Requirements: I will assign problem sets throughout the course. Problem sets will be posted on the course web site.

Other Books:
There are some other very useful books that you might want to look at. The beautiful theory of curves and surfaces is covered nicely in do Carmo's book *Differential curves and surfaces*, Prentice-Hall, NJ, 1976. Much of the background for the modern theory may be found here. In addition, four other very useful books are:

1. M. Spivak: *Calculus on Manifolds*, Menlo Park, CA: W. A. Benjamin, 1965.
2. M. Spivak: *A Comprehensive Introduction to Differential Geometry*, Volume 1, Boston: Publish or Perish, 1975.
3. B. O'Neill: *Elementary Differential Geometry*, New York: Academic Press, 1966.
4. R. S. Millman, G. D. Parker: *Elements of differential geometry*, Englewood Cliffs, N. J.: Prentice-Hall Inc., 1977.

Special Dates

20 January	Martin Luther King, Jr. Day-No classes
15 September	Last date to drop with no W
11 April	Last day to withdraw
17–21 March	Spring break-No classes
2 May	Last day of classes