

## Math 6440, 8440 Syllabus Fall 2006

**Space-Time:** UH 3008 MWF 12-12:50pm

**Instructor:** Mao-Pei Tsui

**Office Hours:** UH2080B M 2:00-3:00pm, W 2:00-4:00pm, F 4:00-5:00pm

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**Homepage:** <http://www.math.utoledo.edu/~mtsui/>

**Class Web Site:** <http://www.math.utoledo.edu/~mtsui/dg06f/dg06f.html>

**Text:** *Introduction to Smooth Manifolds (Graduate Texts in Mathematics Vol 218) (Paperback) by John M, Lee*

**Prerequisites:** *MATH 6410 or permission of the instructor.*

**General description:** *This course continues the study of manifolds begun in Math 3860. In this course, the subject will be smooth or differentiable manifolds, which are manifolds on which derivatives of functions and maps make sense. We will study the basic flora and fauna that live on them: submanifolds, tangent vectors, vector fields, flows, Riemannian metrics and their simple properties, tensor fields, differential forms, orientations. The basic theory and examples of Lie groups (which are groups that are also smooth manifolds) will be woven throughout the course.*

**Homework:** *There will be several homework assignments to be handed-in in class. I encourage you to form study groups to work together on the homework problems (it's usually the best and fastest way to learn). However, when you write up your solutions to hand in, you must write your own solutions in your own words.*

**Exams:** *At the end of this semester there will be a take-home final exam.*

**Grading:** *The following percentages are assigned to the components of the student's grade.*

<i>Homework</i>	<i>70%</i>
<i>Final Exam</i>	<i>30%</i>

**Calendar:**

*Last date to drop*                      *Oct. 13 (Friday)*

*Last date to withdraw*                *Oct. 27*

**Syllabus:** *This syllabus is meant to be a tentative schedule for the semester. A complete syllabus can be found at the class web site.*

<i>Week</i>	<i>Subject</i>	<i>s</i>
<i>1</i>	<i>Ch 1. Smooth manifolds</i>	
<i>2</i>	<i>Ch 1. Smooth manifolds</i>	
<i>3</i>	<i>Ch 2 Smooth Maps</i>	
<i>4</i>	<i>Ch 2 Smooth Maps</i>	
<i>5</i>	<i>Ch3 Tangent Vectors</i>	
<i>6</i>	<i>Ch4 Vector fields</i>	
<i>7</i>	<i>Ch6 The Cotangent Bundle</i>	
<i>8</i>	<i>Ch 7 Submersions, Immersions and Embedding Ch 8 Submanifolds</i>	
<i>9</i>	<i>Ch 11 Tensors</i>	
<i>10</i>	<i>Ch12 Differential Forms</i>	
<i>11</i>	<i>Ch 17 Integral curves and Flows</i>	
<i>12</i>	<i>Ch 18 Lie Derivatives</i>	
<i>13</i>	<i>Ch 19 Integral Manifolds and Foliations</i>	
<i>14</i>	<i>Ch 19 Integral Manifolds and Foliations</i>	
<i>15</i>	<i>Ch 13 Orientations</i>	
<i>16</i>	<i>Ch 14 Integration on Manifolds</i>	