

Topics since the Midterm: Brief Outline  
Math 274  
May 30, 2008

- I. Structures (Munkres, pp. 169-177.)
  - Orientations, volumes, orthogonal structures
- II. Differential forms on  $U \xrightarrow{\text{open}} \mathbb{R}^n$ 
  - A. Multilinear alternating form on tangent space
  - B.  $fdx_1 \wedge dx_2 \wedge \dots \wedge dx_p$
  - C. Exterior derivative  $d : \mathcal{A}^p(U) \rightarrow \mathcal{A}^{p+1}(U)$ 
    - $d \circ d = 0$
  - D. Functoriality
- III. Integration
  - A. Oriented chains
  - B. Independence of parametrization
  - C. Stokes Theorem
    - Boundaries of chains
- IV. Manifolds  $M^k \hookrightarrow \mathbb{R}^n$ 
  - A. Coordinate charts
  - B. Tangent spaces
  - C. boundary
  - D. orientation
  - E. Differential forms on manifolds;  $\mathcal{A}^p(M)$ .