

Lecture 15

All definitions (above) of Euler characteristic coincide (Theorem)

(functions, 1-forms, vector fields, self-intersection of diagonal in $M \times M$)

Lecture 16

Elements of Morse theory. Topological structure near the critical point (nondegenerate, index $\equiv i$). Examples.

Definition of cell complexes.
~~From~~ From Morse functions to cell complexes.
Surfaces of steepest descent, transversality.

Lecture 17

Continuation of Lecture 16
Poincaré dual cell complexes for functions
 (f) and $(-f)$, Homology and Cohomology.
Examples. Sphere, Klein bottle, Tori, Projective Spaces

Lecture 18

Cell complexes (continuation). Simplicial complexes. Poincaré duality for manifolds generated by function.

Lecture 19

Poincaré duality (continuation). ~~Homology~~

~~simplicial and de Rham homology~~
~~Diff Forms~~