

Exam Topics

Here is a list of possible topics for exam questions. At the beginning of the exam, you will be asked to select one of these topics to start with. Background reading (including some proofs omitted in the lecture) can be found in the references listed on the course webpage, see also below.

- Whitney embedding theorem (including proof) [2], [4], [7]
- transversality of a map to a submanifold, transversality for families (including proof), applications [2], [7], [3]
- mapping degree: definition, properties and applications (including proofs) [5], [7], [2], [4]
- tubular neighborhood theorem (including proof) [7], [2], [3]
- intersection between an oriented and a cooriented submanifold, intersection numbers for submanifolds of complementary dimension [7], [3]
- Euler characteristic: definition and alternative methods of computation (including proof) [2], [4]
- gluing manifolds along common submanifolds: construction and examples, surgery [3]
- elements of Morse theory [2], [1], [6]

In general, anything discussed in class may come up in the exam. I might also ask for answers to (the simpler) exercises.

Literatur

- [1] M. Audin and M. Damian, Morse Theory and Floer Homology. Springer Verlag
- [2] M. Hirsch, Differential Topology. Springer Verlag
- [3] A. Kosinski, Differential Manifolds. Academic Press
- [4] I. Madsen and J. Tornehave, From calculus to cohomology. Cambridge University Press
- [5] J. Milnor, Topology from the differentiable viewpoint. University Press of Virginia
- [6] J. Milnor, Morse Theory. Princeton University Press
- [7] J. Robbin, D. Salamon, Introduction to Differential Topology. Book project