Course Category	TBA	Credits	2
Subject Code	TBA	Taking Year	1st Grade, 2nd Grade
Course Title (Japanese)	微分位相幾何学	Course Period	1st Semester
Course Title	Differential Topology	Day of the week / Hour	Friday / The second period
Registration Code	TBA	Compulsory / Elective	Elective
Instructor(s)	Tadayuki Watanabe Eiichi Matsuhashi	Course Qualification	Students of Postgraduate Mathematics Course

Course Style	Lecture
Course Aim	The aim of this class is to understand basic concepts from differential topology. We focus on a Morse theoretic approach to differentiable manifolds and apply it to study differential structures on manifolds.
Goals and Objectives (Level of Achievement)	Understand basic terms and concepts of differentiable manifolds and differentiable maps, and how the differential structures on manifolds can be understood.
Course Plan	1. Differentiable manifolds and differentiable maps 2. Tangent bundle, inverse function theorem 3. Vector fields and flows 4. Transversality 5. Functions on manifolds 6. Morse functions on manifolds 7. Morse's Lemma, Existence of Morse functions 8. Gradient-like vector fields 9. Handle decompositions of manifolds 10. Examples of handle decompositions 11. Homology of manifolds (1) 12. Homology of manifolds (2) 13. Structures of low-dimensional manifolds (1) 14. Structures of low-dimensional manifolds (2) 15. h-cobordism theorem (1) 16. h-cobordism theorem (2)
Teaching Methods	Problems for reports will be given in the class.
Key Words	Morse theory, Differentiable manifolds
Texts	To be introduced in the class
Reference Books	[1] John W. Milnor, Morse Theory, Princeton University Press, 1963. [2] Y. Matsumoto, An Introduction to Morse Theory, AMS, 2002.
Other Teaching Materials	Further references and materials will be given in class.
Performance Evaluation	Grading is based on reports and class attendance.
Notes on the Course	None
Office Hour	To be announced
Other Notes	None