

MTH 827 - Fall 2014

SYLLABUS

Contact information

Cagatay Kutluhan

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Office: Math 117

Office hours: TR 4:00 - 5:00 pm, or by appointment

Lectures

Time: TR 11:00 - 12:20

Place: Math 122

Course description: This course is an introduction to invariants of 3- and 4-manifolds defined via the Seiberg–Witten equations. The course will start with the definition of Seiberg–Witten invariants of smooth 4-manifolds and then focus on the Seiberg–Witten Floer homology of 3-manifolds defined by Peter Kronheimer and Tomasz Mrowka. Our goal will be to understand some of the applications of Seiberg–Witten theory to geometry and topology in these dimensions.

Prerequisites: Solid background in differential and algebraic topology, as well as knowledge of differential geometry (refer to the syllabus and lecture notes for MTH 636 in <http://www.acsu.buffalo.edu/~kutluhan/teaching.html>.)

Grading: Students **may** be asked to present some short papers, if any, in class.

REFERENCES

1. John W. Morgan, *The Seiberg-Witten equations and applications to the topology of smooth four-manifolds*, Mathematical Notes, 44. Princeton University Press, Princeton, NJ, 1996.
2. Peter Kronheimer and Tomasz Mrowka, *Monopoles and three-manifolds*, New Mathematical Monographs, 10. Cambridge University Press, Cambridge, 2007.