

# Syllabus for MATH 289: Topics on Knots, 3 and 4-Manifolds

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## General Course Information

The main goal will be to study smooth 4-manifolds. The plan is to start with knots in 3-manifolds and their interactions with smooth 4-manifold theory. Topics will be chosen from the topology of 4-manifolds via their handlebodies, such as various constructions of 3-and 4-manifolds, by using techniques from gluing, carving, roping, corks, plugs, Gluck construction, and applications of some 4-manifold invariants to these constructions, and state some open problems.

- Class Times Tuesday 12:00 PM - 01:15 PM; Thursday 12:00 PM - 01:15 PM
- Location: Science Ctr 411 (FAS)
- Course Website: <https://canvas.harvard.edu/courses/59687>

## Instructor Contact Information

- Email: [yildiz@math.harvard.edu](mailto:yildiz@math.harvard.edu)
- Office: 524a, Science Ctr (FAS) .
- Office Hours: Tuesday 11:00 AM - 12:00 Noon; Thursday 11:00 AM - 12:00 Noon  
Also by appointment.

## Textbook

The main text for this course will be

- Selman Akbulut: 4-Manifolds

Other texts that may be of interest include

- R.Kirby: The Topology of 4-manifolds
- R.Gompf & A.Stipsicz: Kirby Calculus
- A.Scorpan: The Wild World of 4-Manifolds
- J.Milnor: Morse Theory
- D.Rolfsen: Knots and Links

## Grading

Your grade will be based on the following formula

- Participation (attending course meetings) 80 %
- In class presentation 20 %

## Homework

There will be suggested exercises. These will not be graded, but you are encouraged to submit it and come talk to me about them in office hours.