

Math 996: 3-manifold topology and geometry
Spring 2017

Lecture: MTH 996

Location: C304 WH

Schedule: days: MWF 11:30 AM - 12:20 PM

Instructor:

(Prof.) Effie Kalfagianni,

Office: D-323WH,

Office hours: W 2-3:15 , F 2-3:15 or by appointment.

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Description : This is an one semester course in basic 3-manifold topology. Topics we will discuss will be chosen from:

- Dehn's Lemma and the Loop and Sphere theorems,
- Prime decompositions of 3-manifolds,
- Incompressible surfaces,
- Triangulations and normal surfaces
- Seifert fibered spaces and their classification
- Toroidal decompositions and JSJ decompositions of 3-manifolds.
- geometric structures of 3-manifolds and in particular hyperbolic geometry
- **Note** In examples and specific constructions often particular emphasis will be paid to 3-manifolds that are complements of knots in the 3-sphere.

Below is list of references for reading on above topics. The references that will be primarily followed are indicated in red color. Click on the link to download or obtain more information on each reference.

Reading:

- **A Hatcher: Basic 3-manifold Topology** ,
- **J. Hempel: 3-manifolds.**
- **W. Jaco:Lectures on 3-manifold Topology**
- **D. Rolfsen: Knots and Links**
- **F. Bonahon: Geometric Structures on 3-manifolds**
- **McMullen: The evolution of geometric structures on 3-manifolds** .

- **P.Scott: Geometries of 3-manifolds** .
- **W. Thurston: The Geometry and Topology of 3-manifolds** .
- **J. Purcell: Notes on hyperbolic knot theory**.
- **I. Agol: The Virtual Haken Conjecture** .

Grade: Your grade in this course will be determined by attendance, participation in class discussions and questions.