Algebraic Topology
Michaelmas Term 2018

Christopher Douglas   Email: cdouglas@maths   Office: N2.27

Course time: T12 & W12   Website: www.christopherleedouglas.com/teaching/classes/at/

Course Outline

Tues.	9 Oct	Homotopy and homology.
Wed.	10 Oct	Delta complexes and simplicial homology.
Tues.	16 Oct	Singular homology and homotopy invariance.
Wed.	17 Oct	Homology long exact sequence.
Tues.	23 Oct	Excision and the Mayer–Vietoris sequence.
Wed.	24 Oct	Simplicial equals singular.
Tues.	30 Oct	Cellular homology.
Wed.	31 Oct	Axioms for homology.
Tues.	6 Nov	Cohomology and products.
Wed.	7 Nov	Properties of cohomology.
Tues.	13 Nov	Universal coefficient theorems.
Wed.	14 Nov	Cross and cup products.
Tues.	20 Nov	Künneth theorem.
Wed.	21 Nov	Manifolds and duality.
Tues.	27 Nov	Poincaré duality.
Wed.	28 Nov	Lefschetz and Alexander duality.

References and resources

Hatcher, *Algebraic topology*, chapters 2 and 3.

math.stackexchange.com

Background references

Hatcher, *Algebraic topology*, chapter 1.

Massey, *Algebraic topology: an introduction*.

Stillwell, *Classical topology and combinatorial group theory*.

B3.5 Topology and Groups, course notes.

Sutherland, *Introduction to metric and topological spaces*.

Munkres, *Topology*.

Part A Topology, course notes.

Artin, *Algebra*.

Part A Algebra 2 – Rings and Modules, course notes.

Dummit and Foote, *Abstract algebra*.

Part A Algebra 3 – Group Theory, course notes.

Problem Sheets

There will be four problem sheets.

There is also a preliminary 'problem sheet 0' (not for submission), which students are advised to do during weeks 0 & 1 to revise their background knowledge.

Classes

R1200-1330, cdouglas@maths; TA: alexei.latyntsev@maths

R930-1100, david.reutter@cs; TA: arkadij.bojko@maths

F1200-1330, jan.steinebrunner@maths; TA: jacob.leygonie@maths