**Math 145B (001) Introduction to Topology**
**Spring Quarter 2017**

**Topics to be covered**

### S. Further Properties of Compact Spaces

S.13    Compactness and closed subsets (Sutherland: 13; Crossley: 3.1–3.2, 3.4)
S.14    Sequential compactness (Sutherland: 14; Crossley: 2.1–2.4, 3.3)

### I. Complete Metric Spaces

I.1    Definitions and Basic Properties (Sutherland: 17)
I.2    The Contraction Lemma (Sutherland: 17)
I.3    Completions (Sutherland: 17)

### II. Constructing and Deconstructing Spaces

II.1    Disjoint Unions (Crossley: 5.2)
II.2    Quotient Spaces (Sutherland: 15; Crossley: 5.4)
II.3    Scissors and Paste Theorems (Sutherland: 15; Crossley: 5.4)

### III. Homotopy

III.1    Homotopy (Crossley: 6.1)
III.2    Homotopy Equivalence (Crossley: 6.2)
III.3    The Circle (Crossley: 6.3)
III.4    The Brouwer Fixed Point Theorem (Crossley: 6.4)

### IV. Homotopy Groups

IV.1    Pointed Spaces (Crossley: 8.1–8.2, 8.5)
IV.2    Algebraic Structure (Crossley: 8.1–8.3)
IV.3    Simple Examples (Crossley: 6.3, 8.3)
IV.4    Change of Base Point

### V. Further Topics

V.1    Homotopy and Line Integrals
V.2    Graph Complexes (Crossley: 7.1)
V.3    Chain Groups and Fundamental Groups (Crossley: 9.1)
V.4    Euler Paths

Topics without references are covered in the files `notes*.pdf`, which are listed in the course directory.