CLO for Topology, Math 46300/A6300

Course Learning Outcomes Please describe below all learning out- comes of the course, and indicate the letter(s) of the corresponding Depart- mental Learning Outcome(s).

After taking this course, the student should be able to:

1. (e1, e2, f, g) Write clear and rigorous proofs (or disproofs) of mathematical statements concerning general topology, and indeed to give coherent lectures about the same.

2. (e1, f, g) Understand basic definitions and properties of topological spaces, such as connectedness, compactness , the various separation properties, the fundamental group and covering spaces.

3. (e1, e2, f, g) Prove the infinite intersection property of a nested sequence of non-empty compact sets, and sketch a proof of the fundamental theorem of algebra via degree theoretic and homotopy methods.

4. (a, d, e1, e2) Compute the fundamental group of various simply presented spaces.

5. (a, c, d) Understand some applications of topology to chaotic dynamical systems such as the horseshoe.

Departmental Learning Outcomes The mathematics department, in its varied courses, aims to teach students to:

- (a) perform numeric and symbolic computations

- (b) construct and apply symbolic and graphical representations of functions

- (c) model real-life problems mathematically

- (d) use technology appropriately to analyze mathematical problems
- (e) state (e1) and apply (e2) mathematical definitions and theorems
- (f) prove fundamental theorems
- (g) construct and present (generally in writing, but, occasionally, orally) a rigorous mathematical argument.