Topics covered in MATH8181/8182

MATH8181:

- Two dimensional manifolds (definitions, classification theorem for compact surfaces, triangulations of compact surfaces etc);

- Fundamental group: definition, homomorphisms induced by continuous mapping, fundamental group of a circle, fundamental group of a product space, homotopy type and homotopy equivalence of spaces;

- Van Kampen Theorem and its applications, structure of the fundamental group of a compact surface;

- Covering spaces: definition and examples, lifting of paths to a covering space, the fundamental group of a covering space;

MATH8182:

- Definition and basic properties of cubical singular homology groups;

- Homomorphisms induced by continuous mappings;

- Homotopy property of induced homomorphisms;

- The exact homology sequence of a pair;

- The main properties of relative homology groups;

- The determination of homology groups of various spaces including spheres, finite graphs and compact surfaces.