ICTP DIPLOMA PROGRAMME IN MATHEMATICS 2013-14

Topology

B. Zimmermann (20 lectures : 30 hrs)

General and Algebraic Topology

General Topology:

topologies and topological spaces, bases and subbases, Hausdorff spaces, closure and interior,
limit points, subspaces, product and box topology, continuous maps, metric spaces, first and
second countable spaces, connected and path-connected spaces, compactness and limit point
compactness, compact metric spaces, regular and normal spaces;

Algebraic Topology:

homotopy and path homotopy, fundamental group, coverings, path and homotopy lifting, fundamental group of the circle, of the spheres and projective spaces, retractions and Brouwer fixed
point theorem, fundamental theorem of algebra, theorem of Borsuk-Ulam, homotopy equivalences
and deformation retractions, homotopic maps and fundamental group.

Textbook:

J. R. Munkres, Topology (second edition). Prentice Hall 2000