

## 數學系課程核心教材內容

課程名稱：(中文) 點拓樸學 (英文) Topology				開課單位	學士班
				課程代碼	2103001
學分數	3	必/選修	必選	開課年級	3
教學目標：Understanding general topology and the related topics. 課程概述：The course provides an introduction to general point set topology. Connectedness, compactness and countability of topological spaces are discussed with applications and expositions in case of real line. 先修科目或先備能力：Set theory, Advanced calculus					
建議參考書目	Munkres, <i>Topology</i>				

### 課程大綱

單元主題	內容綱要	上課週數
1. Review of topics from set theory	Fundamental concepts, Functions and relations, The integers and real numbers, Cartesian products, Countable and uncountable sets.	1
2. Topological space and continuous functions	Topology, Topological spaces, Basis for a topology, The subspace topology, Closed sets and limit points, Hausdorff space, Continuous functions, Homeomorphism, Imbedding, The product topology, Box topology, Metric topology, Quotient topology (optional).	4
3. Connectedness	Connected spaces, Path connected, Connected subspaces of the real line, Intermediate value theorem, Components and local connectedness, Path components, Locally path connected.	3
4. Compactness	Open covering, Compact spaces, Compactness and Hausdorff space, Compactness and continuity, Product of compact spaces, Finite intersection property, Compact subspaces of the real line, Extreme value theorem, Uniform continuity, Lebesgue number lemma, Limit point compactness, Sequential compactness, Local compactness, Locally compact Hausdorff space, One-point compactification, Nets and net convergence (optional).	4
5. Countability axiom	Countable basis, First countability axiom, Second countability axiom, Dense subspace, Separable space, Lindelof space.	2 ~ 3
6. Separation axioms	Regular space, normal space, Hausdorff space, The Urysohn lemma, Completely regular space.	2 ~ 3