

# 0: overview

Note Title

2/1/2010

## I: Homotopy theory

- study spaces "up to homotopy"
- every space is "equivalent to a CW cx"
- when does  $\pi_n$ -iso  $\Rightarrow$   $h_{top}$  equiv?
- when does  $H_n$ -iso  $\Rightarrow$   $h_{top}$  equiv?

## Fibrations, cofibrations

## II: Classifying spaces

- Which functors  $\text{Top}^l \text{ spaces} \rightarrow \begin{cases} \text{Sets} \\ \text{Sps} \end{cases}$  are representable? i.e.  $X \mapsto [X, B]$
- Vector bundles, principle bundles
- Classifying spaces of groups

## III: Serre spectral sequence

$F \rightarrow E$   
 $\downarrow$   
 $B$  fiber bundle: compute  $H_* E$   
in terms of  $H_* B, H_* F$

## IV: Characteristic classes

- Chern classes
- Stiefel-Whitney classes

## V: Advanced topics

- Steenrod operations
- cobordism thy