Entanglement Theory

References
John Preskill's lecture notes on quantum information theory, chapters 4 and 10 (new version)
http://www.theory.caltech.edu/~preskill/ph219/index.html
Horodecki x3, Rev mod Phys. http://arxiv.org/pdf/quant-ph/0702225.pdf
Plenio and Virmani, Entanglement Measures: http://arxiv.org/pdf/quant-ph/9707035

Non-locality:
Watrous lecture notes on the CHSH inequality: https://cs.uwaterloo.ca/~watrous/CPSC519/LectureNotes/20.pdf

Monogamy of entanglement: http://arxiv.org/abs/quant-ph/0310037

Sketch of lectures

Topics
- entanglement as a resource theory (entanglement measures) [pure state E.T. is a kind of stuff]
- how to tell if a state is entangled?
- local time reversal vs global
- monogamy of entanglement (applications to cryptography, black holes)
- focus on tools, since they have many other applications.
- Bell's theorem (non-locality)
- teleportation

Is entanglement like a kind of charge? how much?
resource theory
(examples): magic states, coherent operations, reference frames, noisy operations, thermodynamics, correlations
(Local operations)
Class of operations: LOCC
Induces free states: (separable states)
For pure states, the free states are pure product states
We study state transitions (criteria given by monotones)

pure state entanglement theory
dilution
concentration
Carnot cycle

mixed states
Entanglement of formation, Distillable entanglement (D<=E<=E_f)
distance measures
e.g. relative entropy of entanglement -tr\rho\log\sigma -S(rho) (mutual info for LO ops)
squashed entanglement
log negativity

Is a state entangled?
coherent information
ppt criteria
bound entanglement

monogamy of entanglement (Koashi Winter)
Teleportation (see wikipedia)
CHSH (see Watrous's notes)