

# Landscape Ecology

## ENV 714: Topical Outline

Unit	Topics
<i>Introductions</i>	<i>Course preview</i> Student introductions; overview of course materials
<i>1. Agents of pattern</i>	<i>1. The physical template</i> Temperature and moisture gradients; the water balance; geospatial proxies for biophysical factors
<i>2. Agents of pattern</i>	<i>2. Biological processes</i> Pattern and process paradigm (Watt); demographic processes; gradient response and competition; dispersal as agent of pattern
<i>3. Agents of pattern</i>	<i>3. Disturbance regimes</i> Definitions; lessons on disturbance regimes (illustrations); spatiotemporal scaling of regimes; human perspectives
<i>4. Scale and pattern</i>	<i>Scale and scaling</i> The importance of scale; scale as an observational window; scaling techniques (autocorrelation); tactical scaling (sampling)
<i>5. Scale and pattern</i>	<i>Inferences on pattern</i> Components of pattern; pattern metrics and their interpretation; inferences on pattern (illustrations, lessons)
<i>6. Implications of pattern</i>	<i>Populations and metapopulations</i> Metapopulations in theory and in practice; network (graph) models; connectivity conservation
<i>7. Implications of pattern</i>	<i>Communities and patterns of biodiversity</i> Beta-diversity and metacommunities; generative models; partitioning beta-diversity (environment versus spatial process)
<i>8. Implications of pattern</i>	<i>Ecosystem processes and meta-ecosystems</i> Spatial heterogeneity and ecosystem processes; edge effects; resource subsidies and meta-ecosystems
<i>9. Special topics</i>	<i>Urban landscapes</i> Urban ecology and social-environmental systems; cities as mesocosms: the urban stream syndrome, climate change
<i>10. Special topics</i>	<i>Climate-resilient landscapes</i> Climate change and risk management; elements of adaptation; co-benefits: adaptation, mitigation, and environmental equity