Plant communities are the most important biological systems that can simultaneously affect and be affected by projected changes in global climate. How plants respond to change may be the key factor in determining the fate of plants and organisms that directly or indirectly depend on plants. That includes all organisms.

**Objectives of the Course and Teaching Material**

This course will address mechanisms underlying how plants respond to rising levels of CO$_2$, atmospheric N deposition, changes in mean and extreme temperature and precipitation, seasonality, and consequent changes in species populations, interactions among plant species, and plant communities. Course organization will roughly follow: F. Stuart Chapin III, Pamela A. Matson, Peter Vitousek (2011) Principles of Terrestrial Ecosystem Ecology, 2$^{nd}$ Edition, Springer, N.Y. The book can be downloaded from the UIC online library at: [http://link.springer.com.proxy.cc.uic.edu/book/10.1007/978-1-4419-9504-9](http://link.springer.com.proxy.cc.uic.edu/book/10.1007/978-1-4419-9504-9) for free, one chapter at a time. You could buy it from Amazon for $41.62. We will provide additional reading materials as necessary and lecture materials will be posted on Black Board.

**Grading and Evaluations**

10% of your final grade will be based on attendance and participation. The remaining 90% of your grade will be based on two term papers. Each of those will be at least 10 typed pages double-spaced, not including a cover page, illustrations (if any) and literature cited. Most people add citations after the preliminary lists handed in on Oct 5 and Nov 9.

**Deadlines for term papers**

- Sept 21: Topic selection and a brief justification for term paper #1
- Oct 5: Outline and literature citations for term paper #1
- Oct 19: Final draft of term paper #1
- Oct 26: Topic selection and a brief justification for term paper #2.
- Nov 9: Outline and literature citations for term paper #2
- Dec 7: Final draft of term paper #2

**Office Hours**

Dr. BassiriRad can be found in the fourth floor of SEL either in 4273A or 4104 MWF from 12-1 or by appointment

Dr. Howe at 3460 SES M 1-4 or by appointment

**Course content and schedule:**

- **Aug 24**: Introduction, course expectations and basic definitions of Plant Ecology
- **Aug 31 & Sept 14**: Photosynthesis and Carbon dynamics
  - *Light and CO$_2$*
  - *Biological regulation: physiology, allometry, life span*
  - *CO$_2$ and global change*
- **Sept 21 & 28**: Water relations
  - *Principles of plant water potential*
  - *Water movement in the soil, plant, atmosphere continuum (SAPC)*
  - *Biological regulation: physiology, allometry, life span*
  - *Precipitation regimes and global change*
- **Oct 5 & 12**: Mineral Nutrition
  - *Essential elements*
  - *Soil factors and nutrient availability*
  - *Biological regulation: physiology, allometry, life span*
  - *Nutrient availability and global change*
- **Oct 19 & 26**: Species Influences on Ecosystem Processes
  - *Species, guilds and efficiencies*
  - *Species effects on biogeochemistry*
  - *Changing food webs*
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| Nov 2 & 9  | Temporal Dynamics  
Resilience  
Disturbance  
Succession  
*Transient dynamics or alternative states?* |
| Nov 16 & 23| Landscapes and Ecosystem Dynamics  
*Heterogeneity in space and time*  
Patch interactions  
*Changing food webs revisited* |
| Nov 30     | In Your Lifetimes  
*Water: drought, megadrought and their antonyms*  
Agriculture  
Extinctions  
*Human migration, political unrest, civil unrest, war* |