

**E422/E522 UFM, Sp 2017 – Syllabus Part 2 - Course Calendar – 2017 Final
Topics, Readings & Homework - Highlighted items are helpful reading guides**

Week 1 – Introduction to Urban Forests and Urban Forestry - Course/Instructor introduction; Pretest & review; Review Syllabus & Course Calendar & Canvas; Blogs - Treebune, The Nature of Cities & others; Review Class Themes; Introduction to urban forests, arboriculture & urban forestry; Urban forestry historical review; Urban land use trends;

Reading assignments:

History of Urban Forestry (Focus on early urban tree mgmt history, particularly in the Northeast)
Ricard, RM. 2005. Shade Trees and Tree Wardens: Revising the History of Urban Forestry. J. For. 103(5): 230-233.

Gerhold, HD. 2005. The Origins of Urban Forestry, Letter to the Editor. J. For. 103(7): 369-370.

Defining Urban Forests and Urban Forestry (Two foci here – USA history, Europe comparison)
Konijnendijk, C., et.al. 2006. Defining urban forestry – A Comparative Perspective of North America and Europe. Urban Forestry & Urban Greening (UF&UG) 4:93-103.

Current Trends in Land Use (Focus – land use change research; urbanization/Anthropocene)
Rudel, TK, et al. 2005. Forest transitions: towards a global understanding of land use change. Global Environmental Change 15: 23-31.

Nowak, DJ, Greenfield, EJ. 2012. Tree and Impervious Cover Change in U.S. Cities. UF&UG 11:21-30.

The Economist. 2011 (May 26). Welcome to the Anthropocene: Humans have changed the way the world works now they have to change the way they think about it, too. 11p.

Discussion Paper #1 – Welcome to the Urban Forest Writing Assignment – 750-1000 words, figures are extra and encouraged - should include a map, drawing, or pictures of the location (hint: Google Earth) of the street block so the instructor can find where you are writing about. Describe the benefits/ecosystem services (ecological, environmental and/or social) of the street trees in one street block (both sides of the street) found within the Bloomington Downtown Commercial Zoning District (search City of Bloomington Map Gallery). To enhance your written presentation use the National Tree Benefit Calculator (www.treebenefits.com) to evaluate one individual tree from the street block to learn more about the environmental and economic benefits of urban trees and present these findings in a figure/table. Finally, close the paper with a paragraph discussing whether the street's urban tree canopy cover is sustainable, has limitations, etc. You are writing as a technical paper to the instructor. Upload file (file name as follows: last name, first name, DP1) to Canvas Assignment #1. Due 11:15am Thursday, January 19, 25 pts.

Week 2 – Sustainable Urban Forests as Social-Ecological Systems (SES's) – Defining the urban forest – Guest speaker - Dr. Sarah Mincey, Associate Director IPE, IUB SPEA; Urban forest sustainability models and metrics; Introduction to institutions, resilience, robustness thinking; Urban trees/forests - public goods or common pool resources?; See “About the Bloomington Urban Forestry Research Group” (2 pages) website at http://iu.edu/~cipec/research/bufrg_about.php; SOP - Debrief guest speaker

Reading Assignments:

Sustainable Urban Forests and SES's (Course theme; Clark, et al., benchmark UFM publication!)
Clark, JR, et al. 1997. A Model of Urban Forest Sustainability. J. Arboriculture 23(1):17-30.

Kenney, WA, et al. 2011. Criteria and Indicators for Strategic Urban Forest Planning and Management. Arboriculture & Urban Forestry (A&UF) 37(3):108-117.

Ostrom, E. 2009. A General Framework for Analyzing Sustainability of Social- Ecological Systems. *Science* 325: 419-422.

Intro to Sustainability & Urban Forestry (a mixture of simple urban forest sustainability “metrics”)
American Forests - Setting Urban Tree Canopy Goals, 2p. See <http://hpiigreen.com/tag/american-forest/>.

Arbor Day Foundation. 2015. Tree City USA Standards, 2p. ADF website

Ball J, S Tyro. 2016. Diversity of the Urban Forest: We need more genera, not species. *Arborist News* 25(5): 48-53.

Cray, D. 2007. Why Cities are Uprooting Trees. *Time Magazine*, June 21, 2007, 2p.

Louks, P. 2009. The Urban Forest and Community Sustainability. *CitiesGoGreen.com*, p19-22.

Week 3 – Urban Tree Canopy (UTC) Analysis – What is UTC and how is it analyzed; Perceptions and reality; Use and abuse as management tool; Guest speaker Bob Neary, Conservation Information Manager, IN Chapter, The Nature Conservancy

Avins, M. 2013. Baltimore’s Forest Patches: Emerald assets for ecosystem services. 34p.
<http://baltimoregreenspace.org/downloads/ForestPatchesWeb.pdf>

Grove, M., O’Neil-Dunne, J. 2011. Urban Tree Canopy Analysis Helps Urban Planners with Tree Planting Campaigns. *USFS NRS Res. Rev. No. 13* (Summer 2011), 6p.

Nowak, David J. 2012. A Guide to Assessing Urban Forests. *NRS-INF-24-13*, 4 p.

O’Neil-Dunne, J. 2015 (December draft). Tree Canopy Report: Indianapolis-Marion County, IN. USFS, University of Vermont Spatial Analysis Lab, 12p. (2 items, includes 1-page summary)

DP #2 – Introduction to Urban Tree Canopy Analysis Writing Assignment, 750-100 words.

Review the Tree Canopy Report: Indianapolis-Marion County, IN and identify three important takeaways (conclusions, impressions or action points resulting from reading the report). The takeaways might relate best to city-county officials or Keep Indianapolis Beautiful or the media or neighborhoods or individual private citizens, etc. The format of the discussion paper is as follows: Introduction describes how you determined (criteria, etc.) the three important takeaways and then displays the three takeaways as bullet points. Then, prepare three tightly written sections explaining the importance of each takeaway. Finally, for closure consider the combined City of Bloomington/IUB campus, which has not done such a canopy analysis, and write one really important question you would want addressed locally if such a study was proposed. Upload file (last name, first name, DP2). Due 11:15 am Thurs., Feb. 2, 35 pts.

Week 4 - The Benefits/Cost of Urban Trees/Urban Forests – themes: Perceptions & reality, correlations & causation, ecosystem services/disservices; See Human Dimensions of Urban Forestry & Urban Greening at www.naturewithin.info (K Wolf’s U. Washington website); National Tree Benefits Calculator <http://www.treebenefits.com/calculator/>

Reading Assignments (Selected readings; more available in vibrant, growing field of research)

Donovan, GH, et al. 2012. Comment on “Green Space, health inequity, and pregnancy”. *Environmental International* (Correspondence) 39:133.

Donovan, GH. M. Oliver. 2015. Exploring Connections between Trees and Human Health. U.S.D.A. Forest Service, Pacific Northwest Research Station, *Science Findings* 158. 6p.

Hanson, et al. 2016. Human Health & Social Benefits of Urban Forests. *Dovetail Partners*. 13p.

Hauer, RJ, JM Vogt, BC Fischer. 2015. What is the cost of not maintaining the urban forest? *Arborist News* 24(1): 12-17.

Lyytinen, J, M Sipila. 2009. Hopping on one leg –The challenge of ecosystem disservices for urban green management. *UF&UG* 8:309-315.

McDonald et al. 2016 (Ex Sum). Planting Healthy Air: A global analysis of the role of urban trees in addressing particulate matter pollution and extreme heat. The Nature Conservancy. 12p.

McPherson, G., et al. 2005. Municipal Forest Benefits and Costs of Five US Cities. *J. For.* 103(12):411-416.

Nowak, DJ. et.al. 2007. Oxygen Production by Urban Trees in the United States. *A&UF* 33(3): 220-226.

Peper, PJ, et.al. 2009. Lower Midwest Community Tree Guide: Benefits, Costs and Strategic Planting. USDA FS PSW-GTR-219. 115p. (Read Chap 2 in depth & Chap 3 for an overview)

Wolf, K.L. 2013. Why Do We Need Trees? Let's Talk about Ecosystem Services. *Arborist News* 22(4): 32-35.

Week 5 – National-State-Local Players in Urban Forestry (general overview, “chalk talk” presentation by Burney) – State/National players summarization & how things operate for urban forestry funding for programs & research federal>state>local (think neighborhood!) level; Guest speaker - Bill Kinicus, Indianapolis City Forester

Reading Assignments:

State U&CF Case Stories (2014 compilation of 1p state stories, review several for themes), 46p.

State Urban Forestry Program Assessments (Academic assessment of state program)

Wolf, K L. 2007. Urban Forestry in Washington's Cities and Towns: Programs and Progress. Washington Department of Natural Resources Community Forestry Program, No. 20, 3p.

National perspectives on urban forestry (review for general overview and connection to chalk talk)

Vibrant Cities & Urban Forests Task Force. 2011. Vibrant Cities & Urban Forests – A National Call to Action. New York Restoration Project, First Ed. 42p.

Sustainable Urban Forest Coalition (SUFC) - Policy Principles & Operating Procedures, 5p, & Fact Sheet, 2p.

NUCFAC. 2015. Ten-Year Urban Forestry Action Plan Summary (2016-26). 1p

Week 6 – Municipal Urban Forestry & Tree Law - Tree ordinances/boards/planning; Urban forest disturbance planning; Institutions “governing” urban trees; Tree law talk

Reading Assignments:

Municipal Urban Forestry (see Municipal Forestry Folder)

Burban L. 2013. Tree Emergency Plan Worksheet. White paper, 12p.

Johnson G, et al. 1990. Four Phases of a U&CF Program. White Paper, 1p.

National Arbor Day Foundation. 2007. Sample City Tree Ordinance. 1p.

Mincey, SK, BC Fischer. 2013 (April). Solutions for Sustainable Urban Forest Governance and Management. IUB SPEA Insights, 4p.

(Compare two plans for class discussion)

Orndorff, R. 2005. Master Street Tree Plan. City of Rockville Md. 1p.

Bloomington Urban Forestry Plan (2014-2019) 1p.

Urban trees public goods or CPR's? (See PPT used in class.)

Hardin, G. 1968. The Tragedy of the Commons. *Science* 162:1243-1248 (specifically read section "Tragedy of the Freedom in a Common" and ponder public spaces and trees).

USFS. 2009. Understanding and Caring for New York City's Urban Forest. USFS NRS Research Review, USFS No. 8 (Autumn 2009), 6p.

Trees and the Law (Review prior to Tree Law Talk presentation – See Tree Law Folder)

Beerling, PS, Scott, JR. 2006. Premise Liability and Your Trees. 13p.

Macey, SL, Scott, JR. 2008. Why do I Need to Understand Alternative Dispute Resolution. 12p.

Lewis, M. 'Arborcide' and 4 other nasty tree fights. *MSN Real Estate*, 5p.

May v. George, 910 N.E.2d 818 (2009). From WestlawNext 2012. 7p.

Ortiz v. Jesus People, U.S.A., 405 Ill.App.3d 967 (2010). From WestlawNext 2012. 9p.

Parr, et al. 2010. Boundary Line Trees – Who Owns Them? 1p.

Stackhouse v. Royce Realty and Management Corp., 2012 IL App (2d) 110602 (2012). From WestlawNext 2012, 10p.

Stephenson, CE. 2004. Tree Law: More complicated And Plentiful than Many Lawyers Think. *Lawyers Weekly USA*. 8p.

Light Staff. 2007. Trees: what's your liability? *Point Reyes Light*, 3p.

DP#3 – SWOT of current urban tree planting/canopy campaign, 750-1000 words

The assignment is to conduct a brief SWOT (*Strengths, Weakness, Opportunities and Threats; Google SWOT for references and helpful aids, if you are unaware of this analysis technique*) analysis of an active/current (*i.e. on-going, not completed or terminated*) nonprofit, municipal or regional urban tree planting or canopy campaign. You will select a campaign of your choice (*KIB is not allowed!*) and do an on-line review and analysis of the campaign (make sure to include citations of all your work). The discussion paper, 750-1000 words, should clearly describe the initiative and its purposes, the key stakeholders, etc., and then you will construct a brief SWOT to analyze the campaign, not the whole organization conducting the campaign. Finally, you should end the paper with a succinct prediction on the possible success of the initiative. Figures and tables are extra, and should be placed at the end of the paper and cited in the text. Upload file (last name, first name, DP3). Due 11:15am, Tues., Feb 28, 40 pts

Week 7 – Tree Planting &/or Canopy Cover Campaigns (Selected regional/city greening initiatives); NGO's – tree planting & otherwise; KIB presentation – Nate Faris, Molly Wilson & Ned Brockmeyer, review <http://www.kibi.org/programs/overview/>, click on Planting Trees & Youth Program

Reading Assignments:

Roman, LA. 2014. How Many Trees Are Enough? Tree Death and the Urban Canopy. *Scenario Journal* 04. 8p

McPherson, G., Young, R. 2010. Understanding the Challenges of Municipal Tree Planting. *Arborist News* 19(6):60-62

Week 8 – Midterm Exam Week. Catch-up day on Tuesday and Exam on Thursday, March 2.

Note: Schedule subject to change, per guest speakers/weather/field trips

Week 9 & 10 Tree Inventory and Assessment –Two field trips for street tree inventory training & exercise; Discussion Paper #4 (see in-field handout); Guest lecture by Sarah Widney, Craft Lab Mgr., Planted tree survival, growth and i-Tree; i-Tree software <http://www.itreetools.org/>

Spring Break – March 13-17!!!!

Reading Assignments - See Week 9 & 10 folder for handouts, etc., for field exercises, etc.

ISA Basic Tree Risk Assessment Form, 2p

Mincey, SK., BC. Fischer. 2009. The Woodland Campus: A Historic Walking Tour of Indiana University – Bloomington. IU-B SPEA Pub. 20p. <http://www.indiana.edu/~spea/pubs/woodland.pdf>.

Nowak, et al. 2015. Simple street tree sampling. A&UF 41(6):346-354.

Widney, SE, et al. 2016. Tree mortality undercuts ability of tree-planting programs to provide benefits: results of a three-city study. Forests 7(65), 21p.

Discussion Paper #4 – short street tree inventory report, 3-4 person teams. Details TBD!
Note: instructor will conduct a peer review of each team after homework assignment is received.

Weeks 11 – Introduction to Tree Biology (Understanding basic tree biology)

Reading Assignments: (Review Tree Owner's Manual for Next 4 Weeks of Class)

Chaney, WR. 1993. Acer saccharinum – Silver Maple: the "Coyote of Trees." Arbor Age 13(4):31.

Johnson J., et al. 2008. Tree Owner's Manual for the Northeastern and Midwestern U.S. USDA FS NA S&PF, NA-FR-04-07, 36p. Each student will receive a hardcopy of this publication.

USDA. 2006. How a Tree Grows. FS-32, 8p.

Case Study Discussion (Review before PowerPoint lecture in class)

Culley, TM, NA Hardiman. 2007. The Beginning of New Invasive Plant: A History of the Ornamental Callery Pear in the United States. BioScience 57(11); 956-964.

Week 12 - Tree Care and Management – Pruning, risk rating, etc.; Urban tree health management; EAB and other pest case studies

Reading Assignments:

UF Tree Care Myths Summary by B.C. Fischer. 2017. 3p.

Pruning (Major management activity by city foresters)

Clark, JR, N Matheny. 2010. What does research tell us about the practice of pruning in arboriculture? Arborist News 19(1):41-44.

Purdue Forestry and Natural Resources Extension has an excellent set of publications about pruning trees by Extension Specialist Lindsey Purcell – see <https://www.purdue.edu/fnr/extension/blog/2017/02/09/new-publication-tree-pruning-what-do-trees-think/>

Emerald Ash Borer (EAB) will be our thematic pest species for urban forest health mgmt.)

See National EAB website <http://www.emeraldashborer.info/#sthash.YuuIWNhA.dpbs>

See Indiana EAB <http://extension.entm.purdue.edu/EAB/>

Aukema, et al. 2011. Economic Impacts of Non-Native Forest Insects in the Continental United States. PLOS ONE 6(9): e24587. doi:10.1371/journal.pone.0024587.

Sadoff, C., et al. 2017. Tools for Staging and Managing Emerald Ash Borer in Urban Forests. A&UF 43(1): 15-26.

Week 13 - Tree Industry Review - Economic impacts, trends, job opportunities; **Field Day (April 13) with Davey Tree Expert Company/Davey Resource Group – Mark Noark, Aren Flint, etc.**

Reading Assignments:

Review Davey Tree website at <http://www.davey.com/> before Thursday field experience!

Trends in the Green Industry and Tree Care compiled by B.C. Fischer, December 2015

Schmidlin, TW. 2008. Human fatalities from wind-related tree failures in the United States, 1995-2007. Nat. Hazards, Orig. Paper. DOI 0.1007/s11069-008-9314-7, 13p.

Weeks 14 - Tree Planting – Tree selection (& invasive spp.); Rules-of-thumb; Right Tree, Right Place; **Planting/tree care field demo, B'ton City Forester Lee Huss**

Reading Assignments:

The City of Bloomington Tree Care Manual: A Handbook of the Care of Urban Tree, 2015, 24p.

ISA. 2005 Tree Planting BMP's.

Struve, DK. 2009. Tree Establishment: A Review of Some of the Factors Affecting Transplant Survival and Establishment. A&UF 35(1): 10-13.

Week 15 – Graduate Research Paper Presentations, Team Case Study Presentation(s), Course closure & evaluation; Final Exam for UG's, Graduate Research Papers