FNRM 3501
Arboriculture – 3 credits
Spring Semester, 2018

Instructors
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Office Hours: By appointment

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Office: 15 Green Hall  
Lab: 130 Green Hall  
Office Hours: By appointment

Time and Room  
Tuesdays and Thursdays, 1:30-2:45 p.m., Room 19 Green Hall.

Recommended Prerequisites
Biology 1001 or 1009, Dendrology, Botany

Textbook
There is NO textbook for this course. Readings will consist of journal articles, selected chapters, and other selected literature. All readings will be posted to Canvas (canvas.umn.edu).

Course Overview:
Our philosophy for teaching and learning about Arboriculture is to combine in-class discussions with outdoor reality checks. This is Minnesota. No one knows what the weather will bring. Whoops, it just changed. However, expect that almost (but not every) day will offer us an opportunity to take a short stroll on the campus to reinforce materials in the classroom. If it's cold, wear warm clothing. Always have a small notebook with you that can be carried in your pocket or backpack. Everything that is discussed, pointed-out, referred to on the outdoor walks is study material for the assignments, quizzes. Those things are important. If things aren’t pointed out, then they’re not important…or I forgot. It is your responsibility to take notes and make sure that you have everything.

Course Learning Outcomes:
By the end of FR3501 - Arboriculture students will be able to:
1. Adapt understanding of the biological processes of woody plants in the Upper Midwest to trees throughout the world.
2. Evaluate woody plants in relation to planting, pruning, and health using principles of woody plant biology.
3. Devise detailed tree selection plans through prioritization of site selection criteria and client objectives.
4. Communicate abstract and technical tree maintenance concepts to laypersons in a clear and concise manner.
5. Analyze arboricultural literature and distinguish scientifically derived information from information not based on science.

Course Expectations:
Attendance is mandatory. It is up to you to make arrangements prior to missing any class. Reading are assigned because they help to highlight important material which may not be covered in class so you are expected to read through all assigned readings. You are expected to treat all class participants with respect and to be an active
participant in learning, which means: 1) asking questions, 2) participating in discussions, 3) completing assignments in a timely fashion.

**Personal Electronics:**
Cameras and laptops can be useful tools for taking notes or recording images of material covered in class and during field work. Please use electronics for course work only; we reserve the right to limit electronics used in class should they become distracting or disruptive. **Class time is not social media time.**

**Academic workload:**
The University of Minnesota has the expectation that students will spend 3 hours a week per course credit (including time in class) working for a class. **This is a 3 credit course, meaning 2 hours in class and 7 hours outside of class each week.** Readings and assignments have been designed to be able to be completed in no more than 7 hours outside of class (and in many cases much less).

University of Minnesota Policy [http://www.policy.umn.edu/Policies/Education/Education/STUDENTWORK.html](http://www.policy.umn.edu/Policies/Education/Education/STUDENTWORK.html)

**Exams and Assignments:**
There are no hourly exams. However, there are a series of online quizzes and assessments based on assigned reading materials.

I will require that assignments be resubmitted if the original work does not demonstrate a basic understanding of the material or is incomplete or if there are grammar and spelling errors. Credit received for resubmitted assignments will be discussed by you and the instructor. There is no extra-credit in this course.

**Attendance & Late Work:**
Things happen. If you cannot attend class for any reason please notify via email as soon as you know the date(s) you will miss class. Should some kind of emergency arise, please notify as soon as practical so we can work together to get you the material.

Excellent assignments are better than timely assignments…that being said there is only so much time in the semester to complete, provide feedback, and grade assignments. Due dates are set to keep you on track for learning throughout the semester. You will get the most out of assignments completed on time, which in turn allows for faster grading and feedback. Late assignments will be accepted until all of the on-time assignments have been graded and subject to a 10% penalty. Any assignments turned in after that time will not receive credit.

**Course Policies:**
- **Safety:** We may be working with sharp saws and pruning equipment. A safety equipment and operations demonstration will precede these activities. You are expected to follow all safety instructions at all times.
- **Classroom conduct:** Students come from a variety of backgrounds and everyone (including the instructors) is expected to be respectful and polite. No wiggle room here. No extra credit options, either.
- **Academic Dishonesty:** Academic dishonesty in any portion of the academic work for a course shall be grounds for awarding a grade of F or N for the entire course. [http://www.oscai.umn.edu/integrity/faculty/](http://www.oscai.umn.edu/integrity/faculty/)
- **Sexual Harassment:** Sexual harassment (or harassment of any kind) will not be tolerated. [http://www1.umn.edu/usenate/scfa/sexualharassment.html](http://www1.umn.edu/usenate/scfa/sexualharassment.html)
• **Students with Disabilities:** The University is committed to providing quality education to all students regardless of ability. Determining appropriate disability accommodations is a collaborative process. You as a student must register with Disability Services and provide documentation of your disability. The course instructor must provide information regarding a course's content, methods, and essential components. The combination of this information will be used by Disability Services to determine appropriate accommodations for a particular student in a particular course. For more information, please reference Disability Services: [http://ds.umn.edu/student-services.html](http://ds.umn.edu/student-services.html).

• **Religious Observances:** Should you need to miss class or turn-in assignments late due to a religious observance, please make arrangements at the start of the semester. Refer to the course schedule below for exam and assignment due dates. There will be NO penalty, prejudice, etc. for classes, or assignments needing to be rescheduled due to religious observances.

• **Mental Health Services:** As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website: [http://www.mentalhealth.umn.edu](http://www.mentalhealth.umn.edu).

• **Equity, Diversity, Equal Opportunity, and Affirmative Action:** The University will provide equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy: [http://regents.umn.edu/sites/default/files/policies/Equity_Diversity_EO_AA.html](http://regents.umn.edu/sites/default/files/policies/Equity_Diversity_EO_AA.html).

**Grading:**
This course uses a weighted grading system. Each assignment or category is weighted as follows:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Weight</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>Pre-class quizzes</td>
<td>10%</td>
<td>A</td>
</tr>
<tr>
<td>Attendance</td>
<td>10%</td>
<td>A-</td>
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<tr>
<td>Lab samples</td>
<td>10%</td>
<td>B+</td>
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<tr>
<td>Photos of tree pruning</td>
<td>10%</td>
<td>B</td>
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<td>Photos of site analysis</td>
<td>10%</td>
<td>B-</td>
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<td>Trunk flare diameter measurement</td>
<td>10%</td>
<td>C+</td>
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<tr>
<td>Article critique &amp; response</td>
<td>15%</td>
<td>C</td>
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<tr>
<td>Tree autopsy report</td>
<td>10%</td>
<td>C-</td>
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<tr>
<td>Tree information webpage</td>
<td>15%</td>
<td>D+</td>
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<td>Total</td>
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**Assignments Schedule:**

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<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Activity/Assignment/Assessment</th>
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<tr>
<td>Week</td>
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<tr>
<td>1</td>
<td>Jan. 16</td>
<td>Introduction to the FNRM 3501 and Arboriculture as a part of Urban Forestry. Group work.</td>
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<td>2</td>
<td>Jan. 23</td>
<td>Complete - Online activity before class</td>
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<td>Wood – What is wood? How is it formed? What is bark? Diffuse porous vs. ring porous vs. gymnosperms. Water movement in woody plants. 50% classroom, 50% outdoors or lab (room 130)</td>
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<td>Jan. 25</td>
<td>Working in the lab – introduction to your lab sample kits and wood selection</td>
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<td>3</td>
<td>Jan. 30</td>
<td>Complete Online - activity before class</td>
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<td>Benefits of trees: tangible, intangible, evidence-based, opinion-based.</td>
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<td>Feb. 1</td>
<td>Tree biology: Root systems. Horizontal and vertical limits; primary, secondary, tertiary roots; mycorrhizal, actinorhizal, nodular roots, root communication Assignment – Article Critique and Response</td>
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<tr>
<td>4</td>
<td>Feb. 6</td>
<td>Complete - Online activity before class</td>
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<td>Tree morphology: branch attachments, tree forms, trunk diameter ratio (TDR), CODIT, the function of bark, and anatomy of a woody perennial. Assignment – Trunk Flare Diameter Measurement</td>
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<td>Feb. 8</td>
<td>Lab Day – Morphology Rename: Lab Day – Morphology</td>
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<td>Due: Web Page draft of Section 1 completed and submit as Microsoft Word Document via Canvas or email to <a href="mailto:johns054@umn.edu">johns054@umn.edu</a>.</td>
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<tr>
<td>5</td>
<td>Feb. 13</td>
<td>Complete - Online activity before class</td>
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<td>Tree architecture, decay and failure potential.</td>
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<td>Feb. 15</td>
<td>The seven deadly defects of trees and storm damage to trees: prediction, prevention, treatment.</td>
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<td>6</td>
<td>Feb. 20</td>
<td>Complete - Online activity before class</td>
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<td>Arboricultural autopsies of past tree failures on or near the St. Paul campus.</td>
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<td>Feb. 22</td>
<td>Assignment – Tree Autopsy Report.</td>
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<td>Stem Girdling Roots: causes, damage, prevention, treatments. SGR: The Underground Epidemic Killing our Trees</td>
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| 7    | Feb. 27 | **Complete - Online activity before class**  
Tree Health Issues: An examination of Manion’s decline spiral leading to stress and strain  
Tree Condition Rating System  
Mar. 01 | Tree Health Issues. Biotic invaders: oak wilt, emerald ash borer, Dutch elm disease, gypsy moth, Asian long-horned beetle, thousand cankers disease  
Mar. 06 | **Complete - Online activity before class**  
Tree Health Issues. Abiotic site Stresses: soil pH/drainage/nutrient content, mechanical injuries and maintenance practices.  
Mar. 08 | New technology in arboriculture. Inventorying, assessing and reporting more efficiently.  
**Due: Tree Autopsy Report**  
Mar. 13 | Spring Break – Minnesota Shade Tree Short Course – See Gary or Mike for Details  
Mar. 14 | Spring Break – Minnesota Shade Tree Short Course – See Gary or Mike for Details  
Mar. 20 | **Complete - Online activity before class**  
Plant selection and site analysis. In-class activity.  
**Assignment: Photo Site Selection**  
**Due: Draft of Article Critique and Response**  
Mar. 22 | Modifying the planting site. Engineered planting sites. Weather-dependent field trip.  
**Due: Final Project – Section 2 completed and submit as Microsoft Word Document via Canvas.**  
Mar. 27 | **Complete - Online activity before class**  
Minimizing winter damage to trees and shrubs in the landscape: Cold temperature damage; critter damage.  
Fertilizing, aerating, mulching, irrigation, tree growth regulators: intensive management for trees  
Mar. 29 | Best Planting Practices for Long-Term Health  
**Due: Photo Site Selection**  
Apr. 03 | **Complete - Online activity before class**  
Writing plant purchase and planting specifications and contracts. Enforcing plant purchases and planting contracts.  
Apr. 05 | Root collar examinations and decay detection.  
*Location: Research nursery?*
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| 13   | Apr. 10 | **Complete - Online activity before class**  
Formative and maintenance pruning of trees.  
*Location*: Research nursery.  
**Assignment**: Photos Pruning |
|      | Apr. 12 | Pruning woody plants: Rejuvenating and renewing shrubs and other specialized pruning techniques.  
*Location*: Research nursery.  
**Due**: Final Project - Completed rough draft on project website, including all images, and references. |
|      | Apr. 17 | **Complete - Online activity before class**  
Pruning outside – weather permitting.  
*Location*: Research nursery.  
**Due**: Photos Pruning |
|      | Apr. 19 | Urban Tree Risk assessment - Evaluating risk potential.  
Outside – working with a resistograph  
**Due**: Final Draft of Article Critique and Response |
| 14   | Apr. 24 | **Complete - Online activity before class**  
Professions Day.  
*Guest Speaker*: Liam McClannahan, Branch and Bough.  
**Due**: Trunk flare diameter measurements |
|      | Apr 26  | Utility Arboriculture.  
*Guest Speaker*: Randy Miller, Utility Arborist. |
| 15   | May 01  | Harvesting trees: gravel bed trees, balled and burlapped, tree spade.  
*Location*: Research nursery |
| 16   | May 03  | Biology – Pruning – Planting – Management Objectives- Trunk flare diameter results.  
New Technology in Arboriculture.  
**Due**: Final Project - Final webpage due – no more edits. |