

## FORESTRY 432 - SILVICULTURE

Syllabus - Fall, 2019

### Instructors:

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### Office Hours:

1200-100 and 100-200 Monday

By appointment (You say when and I will try to be there)  
and

Open door policy

If the door is open, knock and then walk in.

**Quick Note (right up front): You can use any of the stuff from this class for your own use (I recommend you archive it because you may want the info in a few years); however, NONE of the material from class is to be posted or otherwise electronically published. I feel stupid putting this in the syllabus, but apparently notes from my classes are now on-line. I do not want that.**

### 1.0 GENERAL INFORMATION

#### *Course Description:*

Forestry 432/632. Silviculture. 3 cr. Principles governing establishment, treatment, and control of forest stands; natural and artificial regeneration systems; intermediate cuttings, and cultural operations, with emphasis on the principal forest types of temperate North America. Two hours lecture, three hours lab (total five hours) per week.

**Prerequisites: Forestry 232, 320, Forestry 322, Forestry 332, CNR major or written cons. instr.**

- **NOTE:** Students who are accepted into the course without fulfilling the prerequisites are responsible for bringing themselves "up to speed" on their own. The instructors can identify appropriate readings if needed.

#### *Full Day Marking Camp*

We will be having a mandatory full day marking trip (you will sign up for 1 full-day of timber marking out of 4 possibilities). Dates are the week of October 21 to 24. You will be a mess when you are done, so come prepared. **There will be a 5% reduction in course grade for not attending this without a valid excuse** (this is a VERY important skill and you will have two lab activities that will prepare you for it before the actual marking camp). My opinion is that most forest management in this part of the world starts and ends with a paint gun, I intend for you to go out being able to use one with confidence both from background science as well as practical application.

### 2.0 TEXT and ASSIGNMENTS:

**No text for this class**

### 3.0 GRADING POLICY

Grades will be determined as shown below.

#### Individual grades

Exam one	= 20%
Exam two	= 20%
Final exam	= 20%

#### Grades for lab groups

Silviculture prescription write ups (4) and summaries (5) and final reflection (1)	= 30%
Participation	= 10%

#### Letter Grade Definitions

92.50-100.00 A  
89.50- 92.49 A-  
86.50- 89.49 B+  
etc.

## 5.0 INSTRUCTORS' POLICIES

### 5.1 EXAMS

- There will be two exams during the semester (Tentatively October 15 and November 12) and a final exam.
- During exams, use of electronic/digital devices other than a scientific calculator is **strictly prohibited**. Students who break this rule **will fail the exam**.
- Students who know that they will be absent from an exam/quiz with a valid reason (in the instructor's opinion) must arrange with the instructor **before** the absence to make up the exam/quiz.
- Students who are unavoidably absent with a valid reason (in the instructor's opinion) must make up the exam/quiz **no later than three school days after returning to campus**.
- For absences, it is the **student's responsibility** to arrange for a make-up test, and to obtain all course material missed during any absence. In other words, I will not specifically be looking to see who did and did not take the exam. I will not follow up to reschedule you, it is your job to follow up with me.
- Students without a valid reason for missing an exam/quiz will not be allowed a make-up.

### 5.2 OTHER ASSIGNMENTS

- In D2L, you will find copies articles and papers (refer to the last page of the syllabus to see the assignments and due dates). You are expected to read these articles and prepare a summary of the information found in each.
  - For the papers, this summary will include the following two things: 1) what were the main topics of each paper (about 5 bulleted summary points), 2) a 2-5 sentence summary of your opinion of what you have just read in each article. This generally will take 1-2 pages per article.
  - Discussion Topics 3, 4 and 5 have a component of developing options for stand management. You will need to write a timeline of activities for the next 20 years that will meet the landowner goals. This can be less than half a page but needs to include two things, 1) the sequence of activities and 2) the reason these activities were chosen (i.e. how they met landowner goals).
- These assignments can be done individually or in groups of up to 5 people (I encourage you to do this as an outside of class discussion group but this is solely at your discretion). If this is done as a group, each person will turn in their own copy of the summaries (however, the content of these summaries can be identical if you like).
- Note: while this is a graded assignment, the main goal of the paper summaries is to get you to read the papers. These have been chosen because they coincide with materials that I am covering in class or lab. The section on looking at stand data is to get you comfortable with thinking about stands without having actually seen them (a fairly common occurrence for agencies or companies that hire managers/administrators as well as a field team) as well as making decisions based on stand conditions. I specifically encourage you to work in groups on this topic, many of your classmates have field experiences that will help you. Whether you work in groups or not is up to you.
- Grading on these summaries will be as follows:
  - A (95%)- This indicates that you hit all of the main points in the article and obviously thought out an opinion on what you read. For the stand data, this indicates that you thought about how the goals and the biology need to meet in order for the treatments to be successful (this does not mean you got a "right" answer, this is for practice purposes, only that you put some serious thought into it)
  - B (85%)- This indicates that you read the articles but not quite carefully enough to hit the main points. For the stand data, it indicates that you did not attempt to address all of the goals or you made some significant errors in the biology.
  - C (75%)- You basically tried but something was seriously in error.
  - F (0%)- You either turned in nothing or what you turned in seems to be a better summary of the lyrics to Ozzy's "Iron Man" than a summary of the paper.

Example article summary for a fictitious article

*Article: The impact of oak reserve trees on natural regeneration on dry, nutrient-poor sites*

1. *Maintenance of reserve trees is being promoted in Wisconsin to address goals of land ownership beyond the production of timber*
2. *Generally, oak reserve trees in Wisconsin (particularly northern pin oak) have a higher rate of mortality that in the eastern state where similar research has been conducted*
3. *Oak reserve trees up to 15 square feet of basal area did not reduce advance regeneration success*
4. *Oak reserve trees beyond 15 square feet of basal area had a near linear reduction in advanced regeneration*
5. *Maintenance of moderate levels of oak reserve trees can provide for other landowner goals without impacting the success of regeneration*

*My opinion*

*On sites where timber productivity is not the main goal, primarily small private landownerships, oak reserve trees can potentially serve multiple purposes. Reserve trees can provide mast, shade and structure as well as serve as a source of snags and coarse woody debris as the age. Because up to 15 square feet of basal area there is no significant impact on regeneration suggests that for many landowners, this level of retention or even somewhat higher is appropriate to help in meeting their goals.*

## 5.2 LABORATORY EXERCISES

- This lab will, in large part, be an effort to help you develop stand prescriptions and learn how to effectively mark timber. I, frankly, want you to come out of this class CONFIDENT in your ability to know what a stand needs for the main timber types in Wisconsin. For many of you, this will be your main job during your career and this class is literally the culmination of all of the other classes in forestry that you have had.
- There will be about 4-5 of these. These are all group work (i.e. one per group) submitted through D2L. These will be kept as artifacts for the assessment of this class as a General Education Capstone class. Use the form provided in D2L.

## 5.3 CLASS ATTENDANCE

- Attendance at lecture sessions is **strongly encouraged** but optional. It is the student's responsibility to obtain all material missed during absences.
- Attendance during lab exercises is mandatory. Unexcused absences will result in a reduction of your total class grade (average) by 1% for each missed lab. Switching of lab sections for make-up purposes is not desirable, and for some weeks would not work at all. However, it may be done in extreme cases -- e.g., to avoid missing a lab altogether.

## 5.4 EXPERIMENTAL CLASS

- Guess what, you are an experimental class. Things I learn from different ways of encouraging learning may be used for scholarship of teaching and learning articles. This includes information from pre/post tests, class surveys etc. You will never be individually identifiable from information used (i.e. I may use your comments, but I will not tack your name to it).

## 6.0 CLASS SCHEDULE

- The schedule of topics is given below (**Table 1**). All notes will be available for printoff in D2L. The last two sections may not be covered due to time constraints. Note that there are no specific dates associated with this. I try to lecture in an interactive manner, this means that some topics take longer than I might expect and others go quicker. Plan accordingly and print out the notes ahead of time. Also note that the notesets are mostly “study guides” and not sticky notes, by this I mean that most of what you need to know is in the notes but I will constantly be changing the slideshow as I get new information and photos and this will alter the sequence in which I present materials.

TOPIC	NOTE SECTION
Role And Principles Of Silviculture	1
Regeneration Of Even-Aged Stands	2
Forest Stand Dynamics	3
Clearcut	4
Regeneration Surveys	5
Coppice	6
Two-Cohort Stands	7
Site Prep	8
Intermediate Treatments	9
Uneven-Age Management	10
Urban Forest Silviculture	11



## Lab Schedule

Week	Week starting	Tuesday	Thursday	Friday AM	Friday PM
1	9/3/2019	Silviculture field tour (bus trip to look at stuff) West End of CNR	Silviculture field tour (bus trip to look at stuff) West End of CNR	Silviculture field tour (bus trip to look at stuff) West End of CNR	Silviculture field tour (bus trip to look at stuff) West End of CNR
2	9/10/2019	Canceled (SGT)	GIS/Field computers	GIS/Field computers	GIS/Field computers
3	9/17/2019	GIS/Field computers	Field visit (West End of CNR)	Field visit (West End of CNR)	Field visit (West End of CNR)
4	9/24/2019	Field visit (West End of CNR)	Field visit (West End of CNR)	Field visit (West End of CNR)	Field visit (West End of CNR)
5	10/1/2019	Field visit (West End of CNR)	Thinning field tour (West End of CNR)	Thinning field tour (West End of CNR)	Thinning field tour (West End of CNR)
6	10/8/2019	Thinning field tour (West End of CNR)	Crop tree release activity (West End of CNR)	Canceled (Silv Review Committee)	Canceled (Silv Review Committee)
7	10/15/2019	Crop tree release activity (West End of CNR)	FVS and prescription writing instruction	Crop tree release activity (West End of CNR)	Crop tree release activity (West End of CNR)
8	10/22/2019	Marking Camp Week			
9	10/27/2019	FVS and prescription writing instruction	Canceled (WI Forest Action Plan)	FVS and prescription writing instruction	FVS and prescription writing instruction
10	11/5/2019	Pre-commercial thinning on Little Plover Fisheries Area West End of CNR			
11	11/12/2019	Seat of the pants (SOP) Forestry (West End of CNR)			
12	11/17/2019	Canceled Thansgiving Week			
13	11/26/2019	SOP (wildlife habitat- deer specifically) West End of CNR			
14	12/3/2019	SOP (Restoration) West End of CNR			
15	12/10/2019	SOP (Recreation and Aesthetics) West End of CNR			

A proposed forester motto

*“If I could make a living from walking in the woods, you could bet I'd be sitting pretty good...”* Luke Bryan

Alternative proposed forester motto

*“Soaking in the rain, baking in the sun, don't quit 'til the job gets done”....* Jason Aldean

<b>4.0 Learning Outcome</b>	<b>Examination</b>
Characterize all major silvicultural systems by recognition of when a system is appropriate or inappropriate for a specific site.	Questions that target this objective will usually present stand conditions and then either ask for 1) appropriate systems or 2) present systems and ask for the outcome.
Demonstrate knowledge of regeneration survey by proposing appropriate survey methods for species with various reproductive strategies.	Questions that target this objective will usually 1) present species type and ask what method is appropriate or 2) present data and ask for interpretation as to either biological relevance or quantitative evaluation
Demonstrate knowledge of forest stand and urban forest response to aging, disturbance or stand treatments (forest stand dynamics) by predicting the outcome of management or natural occurrences	Questions that target this objective will usually 1) present stand conditions and then the disturbance, management etc. and ask for expected outcome, 2) present stand condition and ask for recommendations to get to a specific goal or 3) present stand conditions and ask you to propose possible outcomes of various management techniques.
Characterize the response of natural and artificial regeneration to various regeneration conditions and use this knowledge to propose methods for achieving successful regeneration	Questions that target this objective will usually 1) present overstory and understory stand conditions and ask for appropriate methodologies to get regeneration or 2) present conditions and management and ask you which species will dominate
Demonstrate knowledge of several methods of density management for forest stands (stocking charts, stand density diagrams and stand density indices) by proposing stand treatments for various species mixes.	Questions that target this objective will usually 1) present current stand conditions and provide various density management tools (stocking charts etc.) and will ask you to propose a timeline and methodology for treatments
Demonstrate knowledge of the principle of vegetation management (mechanical and chemical vegetation control, fertilization and pesticide use) by proposing vegetation management strategies for various stand and urban forest conditions .	Questions that target this objective will usually 1) present a vegetation management scenario and ask what is needed to address this scenario, 2) present a class of chemical and ask the mode of action or other specifics, 3) present a specific chemical and ask how it is used, 4) present a chemical failure and ask for troubleshooting
Combine knowledge of all of the above skills to propose management activities for parcels (private rural, industrial/investment, urban, recreational and others) that meet landowners goals (both commodity and non-commodity uses)	Questions will vary greatly but will heavily favor story problem with stand data and landowner goals provided and a question that asks for a timeline of treatment activities to meet this goal.

## Schedule for Reading/Stand Data Summaries

### Due Date

- Sept 19      Tree Genetics Topics  
                 Rousseau “What are genetically improved seedlings”  
                 WI DNR Forest Genetics Program “Strategic Plan”
- Sept 26      Oak Site Treatments  
                 Demchik et al. “Observations of the Impact of Soil Scarification and Fire...”  
                 Cook et al. “Oak Regeneration in the Southern Appalachians...”  
                 McEwan et al. “Multiple interacting ecosystem drivers”
- Oct 3         Recovering High-grades (I want you to have read this before the marking class)  
                 Nyland “Rehabilitating Cutover Stands: Some Ideas to Ponder”  
                 Look at supplied stand data and discuss options for meeting landowner goals
- Oct 10       MTE and Stand data  
                 Menominee Tribal Enterprises “The Menominee Forest Management Tradition...”  
                 Look at supplied stand data and discuss options for meeting landowner goals
- Oct 29       UEA and Stand data  
                 Pond et al. “Sustainability of Selection System in Northern Hardwood Forests”  
                 Look at supplied stand data and discuss options for meeting landowner goals