SOE 304 – ECOSYSTEM FIELD MEASUREMENTS

Fall 2022

Credits: 4 credits
Class time/place: Tue./Thurs. 12:05 – 13:20 PM / TROY 309
Lab time/place: Tue. 13:30 – 16:20 PM / TROY 309 (*unless otherwise notified*)

Instructor: Dr. A.J.H. Meddens
Email: arjan.meddens@wsu.edu
Tel: 509-335-5870

Office hours: By appointment (email: arjan.meddens@wsu.edu).

Prerequisites: SOE 204; SOE 300 or BIOLOGY 372 concurrent enrollment in either; SOE 301 or concurrent enrollment.

Course description: SOE 304 – 4 credits (3–3). Measurement and analysis of forests, wildlife habitat, and rangelands using field equipment and spatial sampling techniques; development of employment skills in forestry, forest restoration, and wildlife management.

Required textbook and course materials:

Textbook: Kershaw, J. A. K., M. J. Ducey, T. W. Beers, and B. Husch. 2016. Forest Mensuration. 5th edition. Wiley Blackwell, Chichester, UK; Hoboken, NJ. Available at: http://doi.wiley.com/10.1002/9781118902028 [Note: This electronic version is available for free through WSU's library]

Materials Required from Students:

- Spencer Combination Loggers and Diameter Tape (linear distance on one side and diameter on the other). I recommend:
  - Model 950DC (English – 72' for linear distance and 120" for diameter)
- Compass (Silva Ranger compass)
- Laptop with MS Excel (360)
  - Office 360 (which includes Excel) is available for WSU students, see for installation tips: https://vis.vetmed.wsu.edu/online-tutorials/office-365/install-office-365

*** *Materials are available from Forestry Suppliers Inc. and Amazon* ***

Course objectives and learning outcomes

(A) General objectives

My overarching goal in this course is to inspire and enthuse students to learn about ecological field measurements. By learning about various measurement techniques from the single tree to the entire landscape, you will develop the quantitative reasoning, field, and critical thinking skills necessary to address complex issues in the ecology and management of terrestrial ecosystems.

(B) Specific Learning Outcomes

The student will learn, among other skills, to:

1. Recognize the importance of variation in ecological systems and the need for statistical reasoning.

2. Understand the connection between basic forest measurements and basic ecological concepts and principles.

3. Demonstrate correct use of instruments and techniques for log, tree, stand, and forest level measurements.

4. Write forest inventory reports that support specific multiple land management objectives and constraints.

5. Develop scientifically sound and testable hypotheses and design studies to test these hypotheses.

6. Use both Microsoft Excel and the R environment for statistical programming to access, analyze, and graphically display data.

7. Demonstrate competency in oral and written communication of statistical results.

Expectations for Student Effort

Students should expect to spend 2.5 hours in lecture each week. For each hour of lecture, students should expect to have a minimum of two hours of outside study or work. Students should expect to spend three hours per week in laboratory session, and a minimum of two hours for lab preparation and write-up of laboratory exercise materials.

Grading Policy

Two tests will be conducted (tentatively on Thursday Oct 6 and Thursday Nov 17). Tests will draw from all material in lectures, readings, and laboratory assignments. The grades will be calculated as follows:

Item	Percentage of grade
Participation in class discussion board	5%
In class participation	10%
Laboratory assignments (11 in total)*	35%
Test 1	17.5%
Test 2	17.5%
Final project (stand exam)	15%

*I will drop your lowest laboratory assignment grade.

Your final grade for the semester will be based on a percentage basis using the following distribution: A (93-100), A- (92-90), B+ (89-87), B (86-83), B- (82-80), C+ (79-77), C (76-73), C- (72-70), D+ (69-67), D (66-63), F (<63). All percentages will be rounded up to the nearest whole number prior to assigning your final grade.

Key course policies
Late Policy: It is my policy to not accept late assignments for unexcused absences. In the event you are unable to attend class due to university sponsored events, military service responsibilities, Access Center approved accommodations or personal circumstances, you should inform me as soon as possible to make arrangements for making up the work.
Attendance: I do not take attendance, however the **easiest way to do well in this class is to come to class.**

Note:

- **Cell Phones: No cell phones during the lectures or lab assignments.**

Questions: Please pose your questions about class content, reading, and assignments on the Blackboard discussion board. If you know the answer, please help your classmates and provide a quick response. I will address only questions that go unanswered for more than 24 hours. For questions about grades please see me during office hours.

Class Participation Students and faculty each have responsibility for **maintaining an appropriate learning environment**. Please remember to:

1. Respect others' rights to hold opinions and beliefs that differ from your own. Challenge or critique the idea, not the person.

2. Listen carefully to what others are saying even when you disagree with what is being said. Comments that you make (asking for clarification, sharing critiques, expanding on a point, etc.) should reflect that you have paid attention to the speaker's comments.

3. Be courteous. Don't interrupt or engage in private conversations while others are speaking.

4. Support your statements. Use evidence and provide a rationale.

5. Allow everyone the chance to talk. If you have much to say, try to hold back a bit; if you are hesitant to speak, look for opportunities to contribute to the discussion.

6. If you are offended by something or think someone else might be, speak up and don't leave it for someone else to have to respond to it.

Approximate Course Schedule

Week	Topic	Required readings
1-2	Introduction and basics of measurement	Kershaw et al. 2016 – Chapter 2
3	Basics of statistics	Kershaw et al. 2016 – Chapter 3: Sections 3.1-3.7
4	Mapping, navigation and land area determination	Kershaw et al. 2016 – Chapter 4
5	Basic tree attributes	Kershaw et al. 2016 – Chapter 5 & 6
6	Primary forest products	Kershaw et al. 2016 – Chapter 7
7	Stand attributes & sampling trees with fixed and varying probability	Kershaw et al. 2016 – Chapter 8: Section 8.1 & 8.3-8.9 Kershaw et al. 2016 – Chapter 9: Section 9.1-9.4 Kershaw et al. 2016 – Chapter 11
8	Species composition	Kershaw et al. 2016 – Chapter 8: Section 8.2
9	Hypothesis testing and regression resource management	Kershaw et al. 2016 – Chapter 3: Sections 3.8 – 3.9
10	Introduction to sample design	Kershaw et al. 2016 – Chapter 10
11	Sampling downed wood	Kershaw et al. 2016 – Chapter 12
12	Integrating remote sensing into forest inventory I & II (lidar)	Kershaw et al. 2016 – Chapter 13 / Handout (tbd)
13	Measurement of tree & stand growth: Part I	Kershaw et al. 2016 – Chapter 14
	THANKSGIVING BREAK	
14	Measurement of tree & stand growth: Part II	Kershaw et al. 2016 – Chapter 14
15	What have we learned?	
16	FINALS WEEK	

WSU Reasonable Accommodation Statement
Students with Disabilities: Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center. To learn more please visit http://accesscenter.wsu.edu or contact the Access Center directly (tel: 509-335-3417, email: access.center@wsu.edu, address: Washington Building 217).

Reasonable Religious Accommodation
Washington State University reasonably accommodates absences allowing for students to take holidays for reasons of faith or conscience or organized religious activities conducted under the auspices of a religious denomination, church, or religious organization. Reasonable accommodation requires the student to coordinate with the instructor on scheduling examinations or other activities necessary for course completion. Students requesting accommodation must provide written notification within the first two weeks of the beginning of the course and include specific dates for absences. Approved accommodations for absences will not adversely impact student grades. Absence from classes or examinations for religious reasons does not relieve students from responsibility for any part of the course work required during the period of

absence. Students who feel they have been treated unfairly in terms of this accommodation may refer to Academic Regulation 104 - Academic Complaint Procedures.

WSU Academic Integrity Statement
Academic integrity is the cornerstone of higher education. As such, all members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Academic integrity will be strongly enforced in this course. Students who violate WSU's Academic Integrity Policy (identified in Washington Administrative Code (WAC) 504-26-010(3) and -404) will fail the assignment and will not have the option to withdraw from the course pending an appeal, and will be reported to the Office of Student Conduct. Cheating includes, but is not limited to, plagiarism and unauthorized collaboration as defined in the Standards of Conduct for Students, WAC 504-26-010(3). You need to read and understand all of the definitions of cheating: http://app.leg.wa.gov/WAC/default.aspx?cite=504-26-010. If you have any questions about what is and is not allowed in this course, you should ask course instructors before proceeding.
If you wish to appeal a faculty member's decision relating to academic integrity, please use the form available at conduct.wsu.edu.

Classroom Safety Statement
Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the "Alert, Assess, Act," protocol for all types of emergencies and the "Run, Hide, Fight" response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able). Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the FBI's Run, Hide, Fight video and visit the WSU safety portal.

Steffen Center Dog Exclusion Zone
To reduce exposure of deer to the sight, sounds, or scent of dogs, while still providing access to students assisted by a legally designated service animal, a Dog Exclusion Zone exists within the Steffen Center and the WSU Arboretum that is warranted and legally justifiable under the provisions of the ADA. https://environment.wsu.edu/facilities/