DEPARTMENT OF RENEWABLE RESOURCES
UNIVERSITY OF ALBERTA
Renewable Resources 322 : Forest Ecosystems

FALL 2018 - Syllabus

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Term Fall 2018
Classes[1] MWF 11h00 to 11h50; ECHA L1-150
(**Yukon Section: MWF 10h00 to 10h50 PST, Yukon College C1442 Conf Room B**)
Labs[2] T, W or F 14h00 to 16h50 (T NRE 2-117; WF Arts 109)[3]
(**Yukon Section: F 13h00 to 16h00 PST, Yukon College A2601**)
Credits 3 credits

[1]We will not meet face-to-face during every scheduled class period; some days there will be pre-recorded lectures for you to view, or readings or other activities for you to complete on your own in preparation for subsequent in-class learning. The details week to week will always be available through eClass.

[2]A full day Saturday field trip is required to complete field-based lab exercises for the course: on Sat. Sept. 15 for students in the Tues. lab section and on Sat. Sept. 22 for students in the Wed. and Fri. lab section. We will be travelling by bus – leaving from the south side of GSB (loading bay) at 08:30 sharp. Please arrive 10 minutes early and come prepared to work outdoors, regardless of the weather. We should return to campus by 16h00. **For students in the Yukon section the field trip will**

be on Saturday, September 22nd at 9h00.

[3]Note that location is subject to change for labs that do not require computers, details below and on eclass.

Relationship to RenR 501 and 721: Graduate students enrolled in RenR 501 (Yukon, Dr. F. Schmiegelow) or 721 (Edmonton) will participate in most of the activities of RenR322 but with higher expectations for workload, learning outcomes, and academic performance. For example, students in RenR 501 or 721 will write different exams, will be required to complete additional assignments, and will be assigned final grades using a different scale. Details can be found in the syllabus for RenR 501 or 721.

Course Description: Analysis of the structure and function of forest ecosystems from a stand to a landscape perspective. Topics include physical forest structure and heterogeneity, community composition, energy flow, productivity, nutrient cycling, succession, ecosystem classification, impacts of natural and anthropogenic disturbance.

Course Pre-Requisites: BIOL 208 or by permission of instructor. Students are responsible for ensuring they have the necessary pre-requisite(s) and may be dropped before or after the course drop date if they have not met this requirement. Students must obtain written verification of permission to waive the pre-requisite using the form available from the Faculty of ALES Student Services Office (AgFor 2-06).

Course Format: This course will be taught using a partially 'blended learning' style. In addition to lectures given during class periods, some of the content will be delivered through pre-recorded lectures, videos, assigned readings or other out-of-class activities. Thus we will not meet face-to-face in every scheduled lecture period. Some of the face-to-face time during scheduled lecture periods will be devoted to "active learning" designed to help students synthesize and apply knowledge. The laboratory portion of the course will involve a full day (Saturday) field trip and in-class activities designed to help students develop practical skills and allow them the opportunity for real-world applications of the knowledge and concepts being developed through the 'lecture' portion of the course.

Course Objectives: My objective is to provide students with the basic knowledge, skills and opportunity to develop their understanding of ecological principles as they apply to forest ecosystems. A review of general principles will be accompanied by specific illustrative examples along with exploration of how those principles can be applied to make predictions of ecological consequences under different scenarios. An underlying theme in the course will be the application of ecological knowledge to management of forests for a diversity of values.

Recommended References: *On reserve in Cameron library*

Barnes, B.V., D.R. Zak, S.R. Denton, S.H. Spurr. 1998. Forest Ecology. John Wiley & Sons.

Kimmins, J.P. 2004. Forest Ecology: A foundation for sustainable management. (3rd Edition) Macmillan, New York.

Perry, D.A., R. Oren, S.C. Hart. 2008. Forest Ecosystems. Johns Hopkins University Press.

Course Website: is on eclass: https://eclass.srv.ualberta.ca

Pre-recorded lectures, powerpoint slides, pre-readings etc. for lecture, as well as materials for the laboratory portion of the course will all be posted on eClass. Copyrighted material contained in posted slides is reproduced under ss. 29-29.4 of the Canadian Copyright Act. These documents are available for your individual use; further distribution may infringe copyright.

Field trips and labs: There will be a full day field trip on a Saturday in September (see Lab Schedule).

Course goals: Through the course students will -

- Develop a solid understanding of key ecological principles as they apply to forest ecosystems
- Learn to recognize and appreciate interactions and processes underlying forest structure and function
- Gain experience in applying ecological knowledge to manage forests for a diversity of values
- Learn how to obtain information from a variety of sources and critically evaluate it

Course learning outcomes: By the end of the course students will be able to

1. Describe different components of forest structure; explain and give examples of how these are related to ecological function
2. Compare forests with different structure and determine how this will affect biodiversity and ecological function
3. Classify forests using biological and environmental information
4. Explain and give examples of the ecological processes underlying changes in forest structure and composition over time
5. Make predictions about how forest structure, composition and ecological function will change in the future
6. Describe the main pathways and compartments for flow of energy, nutrients and water in forests; compare these among different types of forest and in response to different types of disturbance
7. Create hypotheses about the impacts of different management interventions and natural disturbances on forest structure and function
8. Apply ecological understanding of forest structure and function to forest management
9. Articulate informed opinions about ecological issues facing natural resource professionals

Learning outcomes for the lab component. By the end of the course students will be able to:

- Sample for, describe and quantify forest structure, composition and plant biodiversity
- Organize field data, complete simple analyses of these data, correctly interpret and draw inferences from the data
- Develop scientific hypotheses and prepare a professionally-written report, following a prescribed format, that presents the results of data collection and analyses designed to test those hypotheses
- Measure dendrochronological samples, organize and analyze the resulting data, use these data to make inferences about the pattern and process of forest stand dynamics
- Describe the key factors driving forest productivity and explain how these are associated with carbon cycling. Use modeling approaches to predict the impact of different disturbances and interventions on forest carbon cycling.

Relevance of course goals and learning outcomes to professional certification:

Canadian Forestry Accreditation Board (CFAB): The course Goals, Content and Learning Outcomes are designed to fulfil some of the requirements prescribed for the following CFAB standards: Standard 1 (Tree and Stand Dynamics), Standard 2 (Forest to Landscape), Standard 5 (Leadership Skills), Standard 6 (Information Acquisition and Analysis), Standard 7 (Professionalism and Ethics). http://www.cfab.ca/English/standards.html

Professional Agrologist: RenR 322 is recognized by the Alberta Institute of Agrologists as a "senior

agrology course" thus fulfilling part of their requirements for professional designation. http://aia.in1touch.org/document/2554/UofA_ApprovedCourseNovember2014.pdf The course goals, content and learning outcomes are relevant to several of the AIA areas of practice http://aia.in1touch.org/site/practice-areas

Professional Biologist: RenR 322 (formerly For 322) is recognized as a "biology" course by the Alberta Society of Professional Biologists https://www.aspb.ab.ca/faq-for-applicants#aca7 ; the goals and learning outcomes of the course are relevant to several of their 'practice areas', although they have not developed specific academic requirements for these.

Marking and Grading

Component	Weight Towards Final grade
Midterm Exam, Wed. Oct. 17 during lecture period	25
Laboratory assignments (see below for details)	30
Participation[1]	10
Final Exam (3 hours), Tues. Dec. 18, 09:00 a.m[2]	35
Course total	100

[1]Participation grade will be based on attendance and participation during face-to-face class time and completion of self-study and self-assessment exercises, as made available through eClass. It will also include active participation in the oral presentations – i.e., asking questions of the other students. Please note: it is an offence under the Code of Student Behaviour to represent yourself as someone else or to allow someone else to represent themselves as you for any portion of the course. i.e., you are not allowed to provide another person with your logon credentials for eClass or to sign any name other than your own to an in-class exercise (or any assignment or exam!)

[2]Students must verify this date on BearTracks when the Final Exam Schedule is posted.

Students' grades on each component of the course will be weighted and then combined to calculate a final % grade. This % grade will be converted to a letter grade which reflects the student's level of achievement with respect to the course learning outcomes as described above. Grade distribution will not be based on a curve; however, an overall course mark of 50% or more guarantees a passing grade of at least D while an overall course mark of 90% or more guarantees a grade of at least A. Grades are unofficial until approved by the Department.

Both exams will encompass all the material presented in lecture and lab components of the course up to that point in time; however, for the final exam greater emphasis will be placed on material presented since the midterm.

Exams will include a mix of short-answer and long-answer questions and may require students to draw diagrams, graphs or simple concept maps. Exams are designed to provide students the opportunity to demonstrate that they have achieved the learning outcomes for the course. Clarity of writing, factual accuracy and the ability to utilize ideas and examples presented and discussed in class will be judged when marking exam questions. Example exam questions will be made available on eClass.

Midterm and Final exams will be marked by the Instructor with closely supervised assistance from the GTAs. The laboratory assignments will be marked by the Teaching Assistants using grading guidelines provided by the Instructor.

Electronic devices: Only non-programmable calculators may be used during exams. Cell phones and all other electronic communication devices are prohibited.

Missed Exams and Assignments: A student who cannot write the midterm exam or who cannot

complete an assignment by the due date/time because of an incapacitating illness, severe domestic affliction or other compelling reasons can apply for deferral. Applications for deferral must be made in writing to the instructor, with supporting documentation, within 48 hours of the time of the exam/assignment due date. If deferral is approved the student will be given the opportunity to take the exam on a later date, or will be granted an extension for submission of the assignment or, at the discretion of the instructor, the weight for the exam or assignment may be transferred to the final exam. The exact timing of these is at the instructor's discretion.

Instructors can neither give permission to a student to miss the final exam nor grant a request for a deferred final exam. Students are encouraged to check exam schedules prior to making travel or event plans. The decision to grant a deferred final exam can only be granted by the Faculty of ALES (go to the Student Services Office in AgFor 2-06 to obtain an exam deferral). Acceptable reasons for an excused absence may include illness or bereavement; weddings, travel arrangements or vacation are not acceptable reasons. The University policy on deferred exams can be found in Section 23.3.2 of the University Calendar. It includes specific instructions on how to obtain a deferral.

Due dates and times for assignments are as described in the detailed course schedule below. Late assignments will be penalized 10% for every 24 hours (or part thereof) that it is late (e.g. a "perfect" paper received 5 days late would receive a grade of 50%). Assignments are considered handed in when they are physically received by the Instructor/TA or when uploaded to eclass (not when slipped under a door).

Collaboration and disputes: When students are required to work in groups to complete lab exercises and assignments it is expected that work will be shared equitably. In the event of a conflict that cannot be resolved within the group, students should contact the instructor who will assist in resolving the issue and will determine how the associated grade will be shared.

Plagiarism and Cheating: "The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University." (GFC 2003). All students are subject to the Code of Student Behaviour, which can be found at:
http://www.governance.ualberta.ca/CodesofConductandResidenceCommunityStandards/CodeofStudentBehaviour/COSBIndividualHyperlinkedSections.aspx
For more information see: http://www.deanofstudents.ualberta.ca/en/AcademicIntegrity.aspx

Students should speak with the course instructor about any questions or concerns about the code. Students should be particularly aware of the code as it pertains to internet and library research, use of class notes or lab assignments of former students, and assistance from others. Note particularly section 30.3.2 Inappropriate Academic Behaviour, which provides clear definitions of Plagiarism and Cheating:

Plagiarism: "No Student shall submit the words, ideas, images or data of another person as the Student's own in any academic writing, essay, thesis, project, assignment, presentation or poster in a course or program of study."

Cheating: "No Student shall in the course of an examination or other similar activity, obtain or attempt to obtain information from another Student or other unauthorized source, give or attempt to give information to another Student, or use, attempt to use or possess for the purposes of use any

unauthorized material.". "No Student shall represent or attempt to represent him or herself as another or have or attempt to have himself or herself represented by another in the taking of an examination, preparation of a paper or other similar activity." "No student shall represent another's substantial editorial or compositional assistance on an assignment as the Student's own work." "No Student shall submit in any course or program of study, without the written approval of the course Instructor, all or a substantial portion of any academic writing, essay, thesis, research report, project, assignment, presentation or poster for which credit has previously been obtained by the Student or which has been or is being submitted by the Student in another course or program of study in the University or elsewhere." "No Student shall submit in any course or program of study any academic writing, essay, thesis, report, project, assignment, presentation or poster containing a statement of fact known by the Student to be false or a reference to a source the Student knows to contain fabricated claims (unless acknowledged by the Student), or a fabricated reference to a source."

Also of particular relevance to students in this class is section 30.3.3 Inappropriate Behaviour in Professional Programs:
http://www.governance.ualberta.ca/en/CodesofConductandResidenceCommunityStandards/CodeofStudentBehaviour/303OffencesUndertheCode/3033InappropriateBehaviourinPr.aspx

The Code of Student Behaviour requires students in pre-professional programs to follow the Codes of Practice for those profession(s) the student plans to or is required to enter. This often is a higher standard than that described in the Code of Student Behaviour and there are significant consequences for students for violating the profession's code of conduct. The profession may impose strict membership requirements in that professional body, which could be denied for a student who is found to have violated the University of Alberta Code of Student Behaviour.

Access to Evaluative Material: Copies of midterm and final examinations from previous years will be available on eclass.

Professionalism and Classroom Rules of Engagement: Face-to-face time during scheduled lecture and lab periods is designed to optimizing students' learning opportunities. Regular attendance and participation in class is expected. Please try to arrive in class on time and arrange your schedule so that you do not need to depart before the end of class. If you have to enter or leave during class please do so quietly. Students are expected to behave in a professional and courteous manner to instructors, guests and classmates. Cell phones, pagers, and other noise-generating devices are to be kept in silent mode during lectures and labs.

Disclaimer: Any typographical errors in this Course Outline are subject to change and will be announced in class.

Lecture Schedule[1]

Dates	**Topic**
Sept 5, 7	Course overview, approach, expectations; Introduction to forest ecology and applications to forest management
Sept 10 - 26	Forest structure at the stand & landscape scale, ecosite classification
Sept. 28 - Oct 26	Disturbance and forest dynamics
Oct 17	**Midterm**
Oct 29 – Nov. 28	Forest ecosystem function – carbon, nutrient water

Nov 12 - 16	**READING WEEK – no class**
Nov. 30 – Dec. 7	Issues in forest ecosystem management

Lab Schedule[1]

Date	Topic
Sept 11, 12, 14	Forest structure - intro. Meet in GSB 211 (T) or GSB 811 (W, F).
Sat Sept. 15	Full day field trip to Strathcona Wilderness Centre (Tuesday lab). Be prepared to work outside all day (bring rain/sun gear, sturdy footwear, lunch, water). Meet at the bus, south side of GSB (loading dock) at 08h30. NOTE we should return to campus by 16h00.
Sept 18, 19, 21	No lab
Sat Sept. 22	Full day field trip to Strathcona Wilderness Centre (Wed. & Fri. lab). Be prepared to work outside all day (bring rain/sun gear, sturdy footwear, lunch, water). Meet at the bus, south side of GSB (loading dock) at 08h30. NOTE we should return to campus by 16h00.
Sept 25, 26, 28	Forest structure: data entry. NRE 2-117 (Tues); Arts 109 (Wed. & Fri.)
Oct 2, 3, 5	Forest structure: analysis. NRE 2-117 (Tues); Arts 109 (Wed. & Fri.)
Oct 9, 10, 12	Ecosite classification. GSB 211 (T) or GSB 811 (W, F).
Oct 16, 17, 19	Ecosite classification: QUIZ. GSB 211 (T) or GSB 811 (W, F).
Oct 23, 24, 26	Dendrochronology. NRE 2-117 (Tues); Arts 109 (Wed. & Fri.)
Oct 30, 31, Nov 2	Dendrochronology. NRE 2-117 (Tues); Arts 109 (Wed. & Fri.)
Nov 6, 7, 9	Carbon budget model. NRE 2-117 (Tues); Arts 109 (Wed. & Fri.)
Nov 14 - 17	READING WEEK
Nov 20, 21, 23	Carbon budget model. NRE 2-117 (Tues); Arts 109 (Wed. & Fri.)
Nov 27, 28, 30	Carbon budget model. NRE 2-117 (Tues); Arts 109 (Wed. & Fri.) ***optional***
Dec 4, 5, 7	Carbon project presentations; GSB 211 (T) or GSB 811 (W, F).

[1] Lecture topics and Lab exercises might change throughout the term. In case of discrepancy between what is listed here and what is said in class or posted on eclass – **the information given in class/posted on eclass will be viewed as correct**

Lab assignments/tests and their value and due dates:
Forest structure assignment part 1 – due Mon. Oct. 15th through eclass (5%)
Ecosite classification quiz – Oct. 16, 17, 19 during lab period (5%)
Forest structure assignment part 2 – due Mon. Nov. 5th through eclass (10%)
Dendrochronology Assignment: Part 1 – due at the end of lab period Oct. 23, 24, 26; Part 2 - due through eclass Fri. Nov. 9 (5%)
Carbon assignment – due during/at the start of lab period Dec. 4, 5, 7 (5%)

"Policy about course outlines can be found in Course Requirements, Evaluation Procedures and Grading of the University Calendar." "Audio or video recording, digital or otherwise, of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s)."