Linnæus University

Dnr: LNU-2023/4085

Course syllabus

Faculty of Technology
Department of Forestry and Wood Technology

4TS022 Skogens ekosystemtjänster, 15 högskolepoäng
Forest Ecosystem Services, 15 credits

Main field of study
Forest and Wood Engineering

Subject
Forest Science

Level
Second cycle

Progression
A1N

Date of Ratification
Approved 2023-11-20.
The course syllabus is valid from autumn semester 2024.

Prerequisites
General entry requirements at an advance level.
Specific entry requirements: English B/English 6.
The English language requirements are considered fulfilled for those who hold a bachelor's degree of 180 credits from a Swedish higher education institution or 120 credits of completed studies at Linnaeus University (LNU). The English language requirements can also be met in other ways, specified on antagning.se/universityadmissions.se. For access to the courses included in the programme, the specific entry requirements specified in the syllabus for each individual course apply.

Objectives

After completing the course, the student will be able to:
Knowledge and understanding

- Describe the various categories of forest ecosystem services and how they can be utilised.
- Explain how forest ecosystem services are measured and valued.
- Discuss how human activities can affect forest ecosystem services.

Skills and abilities

- Identify and classify forest ecosystem services.
- Analyse forest ecosystem services based on ecological conditions and management methods.
- Assess the value of forest ecosystem services by using monetary and non-monetary valuation techniques.

Evaluation skills and approaches

- Assess the effects of different management activities and forest management strategies on ecosystem services from a Swedish and global perspective.
- Identify and critically discuss current and future environmental and anthropogenic challenges for forest ecosystem services and use decisionmaking tools to create sustainable management solutions.

Content

This course provides theoretical and practical knowledge about forest ecosystem services from a Swedish and a global perspective. The course consists of 12 modules covering the following themes:

- Introduction to ecosystem services (module 1)
- Categories of forest ecosystem services (modules 2 – 5)
- Measuring ecosystem services (module 6)
- Valuation of ecosystem services (modules 7 – 9)
- Analysing ecosystem services for decision-making (module 10)
- Payment for ecosystem services (module 11)
- Challenges to ecosystem services (module 12)

Type of Instruction

Course contents will be delivered through lectures, seminars, discussions, field trips and practical exercises with participation of forest industry partners, authorities and international experts. Students will work both individually and in groups. The final course seminar is a compulsory element.

Examination

The course is assessed with the grades U, 3, 4 or 5.

Course examination consists of the following elements:

- Oral assignment (presentation), 2,5 credtis (Pass/Fail)
- Written assignment (essay), 2,5 credtis (Pass/Fail)
- Project work, 10 credits (F,3,4,5)

Student performance will be assessed through an individual oral presentation, a written

group essay and an individually written project work. The overall course is evaluated with the grades Fail, 3, 4 or 5. A ‘Pass’ for the assignments and at least grade 3 for the project work is required to pass the course.

Resit examination is offered in accordance with Linnaeus University’s Local regulations for courses and examination at the first- and second-cycle levels.
In the event that a student with a disability is entitled to special study support, the examiner will decide on adapted or alternative examination arrangements.

Course Evaluation

A course evaluation should be conducted during the course or in connection with its conclusion. The results and analysis of the completed course evaluation should be promptly communicated to students who have completed the course. Students participating in the next course instance should be informed of the results of the previous course evaluation and any improvements that have been made, no later than at the start of the course.

Overlap

The course cannot be included in a degree along with the following course/courses of which the content fully, or partly, corresponds to the content of this course:
4TS016, 3 credits

Other Information

The course materials are available via an online learning management system. Access to the internet and computers is available in the university's computer rooms and at the university library.

Required Reading and Additional Study Material

Acharya RP, Maraseni T, Cockfield G (2019) Global trend of forest ecosystem services valuation – An analysis of publications. Ecosystem Services, 39, 100979.

Blennow K, Persson J, Wallin A, Vareman N, Persson E (2014) Understanding risk in forest ecosystem services: implications for effective risk management, communication and planning. Forestry, 87, 219-228.

Brockerhoff EG, Barbaro L, Castagneyrol B, Forrester DI, Gardiner B, González-Olabarria JR, Lyver PO, Meurisse N, Oxbrough A, Taki H, Thompson ID (2017) Forest biodiversity, ecosystem functioning and the provision of ecosystem services. Biodiversity and Conservation, 26, 3005-3035.

Bruins RJ, Canfield TJ, Duke C, Kapustka L, Nahlik AM, Schäfer RB (2017) Using ecological production functions to link ecological processes to ecosystem services. Integrated Environmental Assessment and Management, 13, 52-61.

Constanza R, de Groot R, Braat L, Kubiszewski I,Fiaromonti L, Sutton P, Farber S, Grasso M (2017) Twenty years of ecosystem services: How far have we come and how far do we still need to go? Ecosystem Services, 28, 1-16.

Everard M (2022) Ecosystem services: key issues. Routledge, Oxon, New York. 340 pp.

Grammatikopoulou I, Vackárová D (2021) The value of forest ecosystem services: A meta-analysis at the European scale and application to national ecosystem accounting.

Ecosystem Services, 8, 101262.

Kubiszewski I, Costanza R, Anderson S, Sutton P (2017) The future value of ecosystem services: Global scenarios and national implications. Ecosystem Services, 26, 289-301.

Mori AS, Lertzman KP, Gustafsson L (2017) Biodiversity and ecosystem services in forest ecosystems: a research agenda for applied forest ecology. Journal of Applied Ecology, 54, 12-27.

Orsi F, Ciolli M, Primmer E, Varumo L, Geneletti D (2020) Mapping hotspots and bundles of forest ecosystem services across the European Union. Land Use Policy, 99:104840.

Seidl R, Spies TA, Peterson DL, Stephens SL, Hicke JA (2016) Searching for resilience: addressing the impacts of changing disturbance regimes on forest ecosystem services. Journal of Applied Ecology, 53, 120-129.

Taye FA, Folkersen MV, Fleming CM, Buckwell A, Mackey B, Diwakar KC, Le D, Hasan S, Saint Ange C (2021) The economic values of global forest ecosystem services: A meta-analysis. Ecological Economics,189:107145.

Wilson SJ, Schelhas J, Grau R, Nanni AS, Sloan S (2017) Forest ecosystem-service transitions. Ecology and Society, 22, 38.