



**UNIS**  
The University Centre in Svalbard

## AB-338 Life History Adaptations to Seasonality (10 ECTS)

[HOME](#) \ [COURSE](#)



### [How to apply](#)

**ID:**

AB-338

**CREDITS:**

10 ECTS

**START DATE:**

May 13, 2020

**END DATE:**

June 18, 2020

**COURSE PERIOD:**

Spring semester (May–June), every second year. Next course: 2020

**LANGUAGE OF INSTRUCTION AND EXAMINATION:**

English

**CREDIT REDUCTION/OVERLAP:**

10 ECTS with AB-838

**GRADE:**

Letter grade (A through F)

**COURSE MATERIAL:**

Curriculum is made up of about 200 pages of selected journal articles and book sections.

**COURSE COSTS:**

Fieldwork, NOK 400–600 (2–3 days x NOK 200 per overnight stay)

**COURSE CAPACITY MIN/MAX:**

10/20 students (AB-338/838 in total)

**EXAMINATION SUPPORT MATERIAL:**

N/A

**APPLICATION DEADLINE:**

October 15, 2019

### [How to apply](#)

#### INSTRUCTORS:



Øystein Varpe

Professor, Ecology

### Course requirements:

Enrolment in a relevant master programme, with priority given to those with thesis projects on life history adaptations to seasonality or the ecological implications of such adaptations.

### Academic content:

Seasonality has strong impacts on biology and is an important part of ecology and evolution. High-latitude ecosystems are highly seasonal in several ways, and are therefore unique laboratories for seasonal ecology. The course deals with how seasonality shapes life histories and population dynamics, focusing on Arctic organisms. Evolutionary adaptations to seasonality will be covered, including analyses of key traits such as migration, energy storage, diapause, and timing of reproduction. Individual variability in annual routines and life history traits will be dealt with. Knowledge gained from these evolutionary perspectives is used to study the drivers of observed phenology and population dynamics of selected Arctic species. Life history theory and the theories for optimal timing and annual routines will be introduced and used actively. Organisms and populations from aquatic and terrestrial ecosystems will be covered with the same interest. Field studies and excursions will illustrate biological diversity, ecological interactions and study methods. The course operates at the research frontier and field projects linked to ongoing research projects will be selected.

### Learning outcomes

#### Knowledge

*Upon completing the course, the students can:*

- Explain the seasonality of key environmental drivers and some of the basic proximate mechanisms behind biological timing within the annual cycle.
- Summarize and apply central elements of life history theory and theories for optimal timing and annual routines.
- Describe the annual routines and life history diversity observed among main groups of Arctic organisms, and analyze the costs and benefits involved in central traits such as energy reserves, diapause/dormancy, migration, and timing of reproduction.

#### Skills

*Upon completing the course, the students can:*

- Identify and develop state of the art research questions within the field of life history adaptations to seasonality.
- Confront models with data in order to test hypotheses on life history diversity observed in the Arctic.
- Design and perform projects on life history traits and phenology of selected Arctic animals or plants.

#### General competences

*Upon completing the course, the students can:*

- Report in a scientific manner, both in writing and orally, on literature studies, field studies and modelling exercises performed during the course.
- Understand the relevance of evolutionary and ecological theory for field based studies of organisms inhabiting seasonal environments.
- Account for, discuss, and criticize classic as well as recent literature within the field.
- Develop and analyze basic statistical and mathematical models.

## Learning activities:

The course extends over 5-6 weeks including compulsory safety training, and is run in combination with [AB-838](#).

Prior to arrival, the student has prepared a presentation of his/her own thesis project. The students are challenged to reflect on the extent that seasonality influences processes studied in their own work. The students will present this work during a conference-style seminar early in the course. The students will have the core curriculum available prior to arrival at UNIS and are expected to have familiarized themselves with this.

The course is run through a combination of lectures, seminars, fieldwork, data analyses, group work and computer labs. We promote active participation and active learning. The course is research based and the students will meet members of the Department of Arctic Biology as well as invited guest lecturers that are international experts in the field. Guest lecturers also contribute to seminars and computer labs.

The fieldwork consists of several shorter excursions near UNIS as well as a two-three day excursion aimed to be located away from Longyearbyen. This gives hands-on experience with the Arctic and the challenges and opportunities Arctic organisms are faced with.

Through seminars we will read, present and discuss scientific literature. Computer labs will provide experience with data analyses and modelling. The students will summarize their learning outcome from the computer labs through reports. The course includes group projects related to the field studies and excursions, including analyses and presentations of the data collected. The final written report is to develop a simplified research proposal, focusing on the ecological and evolutionary background for the proposed research, the research question and predictions identified, and the study design suggested for testing the proposed predictions.

**Total lecture hours:** 15 hours

**Total seminar hours:** 30 hours

**Laboratory work:** 20 hours

**Excursions:** Several shorter excursions (around 25 hours in total) and one overnight excursion lasting 2–3 days (weather dependent)

## Compulsory learning activities:

Field excursions, group project with report, computer labs, student seminars and presentations.

*All compulsory learning activities must be approved in order to be registered for the final assessment.*

## Assessment:

Method	Duration	Percentage of final grade
Written report		100%

**Application deadline: 15 October 2019**



Glaucous gull (*Larus hyperboreus*). Photo: Øystein Varpe/UNIS