



GÖTEBORGS UNIVERSITET

Meta-analysis in Biology and Environmental Sciences, 5 ETC

Course period: 20-25 Oct 2019	Last day for application: 2019-09-23
Course location: SLC Tjärnö	
Course leader / Address for applications: Gunilla Toth / gunilla.toth@marine.gu.se	
Course description (Advertisement for Ph.D. students): <p>Meta-analysis is the statistical synthesis of the results of different research studies. These tools and the conceptual framework in which they are based provide a widely implemented, cross-disciplinary statistical framework for quantifying, pooling, and evaluating the results of different studies on the same topic. In this course, students will learn how to conduct a meta-analysis from start to finish. We will also discuss some common mistakes as well as controversies regarding the implementation of meta-analysis in the biological and environmental sciences.</p> <p>The course starts with individual preparatory literature studies that will be examined through two literature seminars in the first half of October. Students will have an opportunity to join the seminars at a distance or to hand in written summaries. The main part of the course will be taught full-time during one obligatory week at the Sven Lovén Centre for Marine Infrastructure at Tjärnö (SLC) outside Strömstad, October 20-25 2019. Each day during the course will include both theoretical lectures and extensive hands-on experience with practical assignments and group projects. Tjärnö is situated approximately 160 km north of Gothenburg and 130 km south of Oslo. More information about the research station is found at https://loven.gu.se/english/about_the_loven_centre</p> <p>The on-site course, including a study trip by boat, accommodation and meals, is free of charge but students will need to cover their own travel costs.</p> <p>The course is recommended to correspond to 5 ECTS, (5 HP) in total, including the preparatory literature study at a distance and one week of intense studies, on site, at SLC Tjärnö.</p> <p><i>Application and contact: Send a mail including a short (0.5 A4) description of your research and time left to PhD-defense to Gunilla Toth (gunilla.toth@marine.gu.se). Deadline September 23, 2019</i></p>	
Responsible department and other participation departments/organizations: Dept of Marine Sciences, University of Gothenburg; Dept of Ecology and Evolution, Stony Brook University, USA; School of Biology, University of London, UK	
Teachers: Assoc. Prof. Gunilla Toth (course leader and main contact) Prof. Jessica Gurevitch Prof. Julia Koricheva	
Examiner: Prof. Per Jonsson	



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Faculty of Science; Department of Marine Sciences

Meta-analysis in Biology and Environmental Sciences, 5 hp

Third cycle education

1. Confirmation

The syllabus was confirmed by the Head of the Department of Marine Sciences, 2016-03-16.

Disciplinary domain: Science

Department in charge: Department of Marine Sciences

Main field of study: Biology and Environmental Sciences

2. Position in the educational system

Elective course; third-cycle education.

3. Entry requirements

Admitted to third cycle education.

4. Course content

Meta-analysis is the statistical synthesis of the results of different research studies. These tools and the conceptual framework in which they are based provide a widely implemented, cross-disciplinary statistical framework for quantifying, pooling, and evaluating the results of different studies on the same topic. Meta-analysis is firmly established in medical and social sciences research, and has become an important statistical approach in the fields of ecology, evolution and environmental sciences in recent decades. This course will cover the framework of meta-analysis specifically as it is being used in the biological and environmental sciences. Students will learn how to conduct a meta-analysis from start to finish, including formulating hypotheses, extracting data from primary literature, computing effect sizes, testing for the effects of covariates (moderators or explanatory variables), examining assumptions and sources of bias, and presenting the results. We will also discuss some common mistakes as well as controversies regarding the implementation of meta-analysis in the biological and environmental sciences.



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5. Outcomes

After completion of the course the Ph.D. student is expected to be able to:

1. Knowledge and understanding

- Define meta-analysis and describe its role in the research process
- Demonstrate how to assess and interpret variation in effect size across studies

2. Skills and abilities

- List and perform the different steps included in a meta-analysis
- Compute effect sizes and treatment effects
- Compare fixed- and random effect models for synthesizing data

3. Judgment and approach

- Explain how to avoid common mistakes in meta-analysis
- Identify controversies in meta-analysis

6. Required reading

Koricheva J, Gurevitch J, Mengersen K (2013) Handbook of Meta-Analysis in Ecology and Evolution. Princeton University Press. (Selected chapters)

Scientific papers assigned during the course

7. Assessment

Students must actively participate in seminars, lectures, practical assignments and oral presentations. Examination will be in the form of oral presentations individually or in a group.

A Ph.D. student who has failed a test twice has the right to change examiners, if it is possible. A written application should be sent to the Department.

The number of examinations is to be limited to five occasions and the number of placements is to be limited to two occasions.

In cases where a course has been discontinued or major changes have been made a Ph.D. should be guaranteed at least three examination occasions (including the ordinary examination occasion) during a time of at least one year from the last time the course was given.

8. Grading scale

The grading scale comprises Fail, (U), Pass (G)

9. Course Evaluation

The course evaluation is carried out together with the Ph.D. students at the end of the course, and is followed by an individual, anonymous survey. The results and possible



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changes in the course will be shared with the students who participated in the evaluation and to those who are beginning the course.

10. Language of instruction

The language of instruction is English.