Bee diseases
(Bee diseases)

Earliest possible year	BSc. 3rd year to Post experience Master´s Programme
Duration	Outside schedule
Credits	5 (ECTS)
Course level	Joint BSc and MSc
Examination	Continuous Assessment Written examination Portfolio Examination All aids allowed Weight: Balance: The main written report counts 60% and the other reports and participation (80%) count equal and in total 40%. pass[1]/fail, internal examiner
Requirement for attending exam	Participation in course activities and deliverance of reports
Teaching	Lectures, colloquia, practical and theoretical exercises, excursion, web-based conferences.The course is a part of new NOVA (BEE-NOVA, the placing is coordinated with other BEE NOVA courses
Teaching language	English
No credit points with	No overlapping
Optional prerequisites	We recommend fundamental knowledge about ecology, natural resources and fauna in the landscape
Restrictions	15
Areas of competence the course will address	Competences within basic science: Knowledge about honey bee biology and their diseases and parasites. Understanding epidemiology and disease transmission. Evaluate the importance of ecological parameters in honey bee disease control technology and production:. Knowledge about legal aspects of honey bee disease control. Knowledge and understanding of specific methods used for honey bee disease control. Evaluate technical solutions from a theoretical and practical point of view. Experience in diagnosis of bee diseases, for example microbial methods. Use and transfer of knowledge about the biology of bee diseases in relation to research, management and practical bee keeping. Ethics and values: Awareness of and ability to reflect about the importance of honey bees for natural as well as cultivated eco-systems.
Course objectives	The aim of the course is to provide participants an understanding of the ecological, economical, legal, ethical and political factors of

	importance for bee disease control. Further, the aim is to provide the participants with sound ecological tools for their own preparation and evaluation of countermeasures to control bee diseases.
Course contents	The course contain the following elements: Bee biology (social insects societies, concept of super organism, behaviour, pollination). Bee diseases, parasites and other enemies of bees, life-cycles, mode of action, diagnosis, treatment. Mechanisms of disease transmission and epidemiology. Defense mechanisms. Co-evolution of bees and their pathogens. Public control of bee diseases, including legal aspects, import. Ethics and values of relevance for bee keeping and disease control. The emphasis is on pathogens and parasites of economical and ecological importance for bee keeping under Northern European conditions. Also potential emerging pathogens and parasites will be covered. The course will provide the students with a fundamental knowledge and understanding of general problems related to bee keeping and a range of theoretical and practical aspects of bee disease and their control.
Teaching and learning methods	The course is organised as a Nordic NOVA course. During seven consecutive days students will be accommodated in Copenhagen. Teaching is executed by lectures, colloquia, theoretical and practical exercises, excursion and group work. Guest lectures will, together with the main teachers of the course, give the participants the necessary background for their project work. Colloquia include reading and discussion of scientific literature. The excursion includes a visit to the Danish public bee disease laboratory as well as a practical beekeeper. After the seven days at KVL the students prepare their main written report (individual or group) going more into depth. The students will choose their subjects themselves with supervision by the team of teachers. To ensure supervision and discussion between students there will be web-based conferences using Campus net facilities. The main report must be delivered one month after the seven days at KVL and the teachers evaluation will take place immediately after the delivery.
Literature	Honey Bee Pests, Predators, and Diseases, 3rd ed., R.A. Morse and K. Flottum, eds., A.I. Root Co., Medina, Ohio
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Home Page	http://www.beenova.net/Courses/tabid/mid/3204/xmid/22768/xmfid/57/Default.aspx
Attendance fee	Participants from NOVA universities will get travel and accomodation re-imbursed according to NOVA regulations. Other students: contact KVL for information about fees etc.
Study Board	Study Committee NSN
Scope	Lectures 25h Theoretical exercises 5h Practicals 10h Excursions 10h **Sum** 50h