**Course Information Sheet**

<table>
<thead>
<tr>
<th>Subject</th>
<th>AgriGenomics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree programme</td>
<td>1-Subject Master’s Degree Programme</td>
</tr>
<tr>
<td>Qualification</td>
<td>Master of Science (M.Sc.)</td>
</tr>
<tr>
<td>Start of the degree programme</td>
<td>For the 1st semester: only possible to start in the winter semester</td>
</tr>
<tr>
<td>Special admission requirements</td>
<td>Language skills</td>
</tr>
<tr>
<td>Application / registration</td>
<td>Registration (without restricted admission)</td>
</tr>
<tr>
<td>Standard period of study</td>
<td>4 semesters</td>
</tr>
<tr>
<td>Faculty/faculties</td>
<td>Faculty of Agricultural and Nutritional Sciences</td>
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</table>

1. **Degree, teaching and examination language**

**Master of Science (M.Sc.)**

The 1-subject Master’s degree programme comprises study of the subject totalling 93 ECTS credits, as well as the preparation of a Master’s thesis totalling 27 ECTS credits.

Information on the [structure of the Master’s degree programme](#) can be found in the degree programmes on offer section under degree structure.

Lectures will be offered in English. Examinations will be in English.

2. **Object and aim of the course**

**Object of the degree programme**

Genome research has made a significant contribution to all areas of life sciences over the last few years. The complete sequencing and analysis of whole genomes and the comprehensive analysis of gene expression (transcriptomics) as well as of proteins (proteomics) and metabolites (metabolomics) allow completely new insights into the development and evolution of living organisms. At the same time, they are also opening up previously unknown opportunities for the genetic enhancement of crops and livestock as well as the optimisation of agricultural production processes. The techniques, strategies and knowledge relevant to genome research are combined here under the term “genomics”. Students of the Master’s degree programme in AgriGenomics are offered the opportunity to acquire advanced knowledge in the field of genomics and proteomics as well as become familiar with the application of these technologies in agricultural research and development. The aim of the degree programme is to provide its students with specialist and interdisciplinary knowledge of crop and livestock sciences through modern genome research and its application. This includes mastery of the relevant techniques, the ability to evaluate, assess and apply genomic data, as well as an advanced understanding of livestock breeding methods, plant nutrition and phytopathology. The students are familiarised with the latest technical developments through, among other things, intensive practical laboratory courses and excursions to institutions of applied genome research in Germany and abroad, which lends a direct practical connection to the students’ acquired knowledge.
Theories and techniques of structural and functional analysis of genomes and the proteome of livestock and crops are taught in this degree programme. Students also learn about the structure and function of genomes and proteomes. The focus here is on the interaction between genes and/or their regulation to produce phenotypic variations, so that the students understand how changes to the function and regulation of genes affect the adaptation of agricultural production conditions.

The degree programme focuses on producing genetic and physical maps, as well as high-throughput methods of genotyping animals and plants and also harmful organisms, and the phenotyping of plants. Genomic techniques are of increasing importance in animal and plant breeding. For this reason, this degree programme prioritises the use of these techniques for the enhancement of plants and animals through breeding. This includes methods of marker and/or genomic selection, and, to an increasing extent, methods of analysis of the whole genome using SNP chip arrays, microarrays and resequencing.

The discovery of genes that are valuable from the perspective of breeding is also dealt with in this degree programme, as is the use of genomic information to broaden the genetic basis of crops through mutation or transformation or of livestock through marker-assisted breeding strategies.

The aim is for students to understand the interplay between the genome and proteome on the one side and environmental factors on the other, which is affected by agricultural production methods (fertilisation, plant protection, feed and management). They will also learn about interactions between the genome and abiotic as well as biotic stress factors. In addition, the degree programme offers deeper insights into the genetic foundations and molecular mechanisms of the interaction between plants and/or animals and stress factors. One area of focus here will be on molecular mechanisms of adaptation to abiotic and biotic stress conditions, and how these findings can be used for breeding and analysing plants with new resistance characteristics, as well as for developing new active substances and principles in defence against harmful agents. By contrast, the focus as regards livestock is on the potential for breeding robustness under different husbandry conditions and different levels of production. The students will also learn about the molecular diagnostics of harmful agents, including genome-based methods and genomic data. In addition, the aim is for the students to understand genotypic differences in nutrient efficiency so that they can assist with the conservation of resources in future research fields. Genotypic differences in the quality of plant and animal-based raw food materials are also explained using genome and proteome analysis-related examination methods. The degree programme purposefully lays the foundations for a subsequent doctoral degree in order to meet the growing demand for highly-skilled specialists in this science.

The Centre for Molecular Biosciences (ZMB) at Kiel University is designed to support the new focus on the area of genome research. It is equipped with state-of-the-art equipment for genome research and so is of particular benefit to students of the Master’s degree programme in AgriGenomics, too. Academic studies are supplemented by practical work in laboratories and excursions to major research institutions as well as companies operating worldwide in the breeding, agrobiotech, life science and food industries, so that the knowledge acquired by the students has a direct practical connection.

The Master’s degree programme is designed to be an international programme, as genomic research, and especially its application, is based to a large extent on international networks. All courses are fully offered in English.
Personal interests

- Interest in working with crops and livestock
- Interest in the molecular basics of plant and animal production
- Interest in molecular phytopathology (diagnostics and plant-parasite interaction)
- Interest in molecular biological techniques
- Interest in interdisciplinary learning
- Enjoyment in communicating with students and lecturers from Germany and abroad

More information on the subject

- Faculty of Agricultural and Nutritional Sciences
- Information on the Master’s degree programme in AgriGenomics
- Departmental Student Organisation for Agriculture and Ecotrophology

3. Possible careers and areas of employment

Graduates of this degree programme enjoy employment opportunities in university and non-university research as well as in industry. In the public authority sector new developments have to be assessed and the advantages and disadvantages of new technologies have to be presented objectively to the general public:

- Leading roles in research and development
- Agrobiotechnology companies, as well as companies operating in the fields of livestock breeding, veterinary medicine, plant breeding, plant nutrition and plant protection
- Food industry companies, as well as the entire biotechnology sector
- Public institutions like authorities and ministries

4. Advanced studies at Kiel University

Students may follow up their Master’s degree with a doctoral degree.

The requirements for admission to the doctoral programme, as well as information on the doctoral degree procedure, can be found in the doctoral degree regulations of the faculties.

You can find out more about doctoral degrees at Kiel University’s Graduate Center.

5. Requirements and knowledge

Admission requirements

Requirements for admission to the Master’s degree programme are a Bachelor’s degree in agricultural sciences, biology, bioinformatics, biochemistry, genetics and related disciplines or an equivalent qualification.

For registration, evidence must be provided that the Master’s degree admission requirements have been fulfilled in accordance with the examination regulations and the study qualification rules (Studienqualifikationssatzung).

The relevant examination regulations and the study qualification rules (Studienqualifikationssatzung) can be found at www.studium.uni-kiel.de/de/pruefungen.
Aptitude test

Students may register for the Master’s degree programme in AgriGenomics after passing an aptitude test. Please contact the Academic Advisors (see Section 7) for more information about the aptitude test and registration periods.

Here you will find the registration deadlines and forms for the aptitude test.

Language skills

In accordance with the study qualification rules (Studienqualifikationssatzung), the following language requirements apply and evidence that these have been fulfilled must be provided when registering:

- very good knowledge of English, substantiated by the TOEFL® ITP (paper-based test): 550 points or a comparable test, or completion of a Bachelor’s degree in English

For questions about the required language skills, please contact the respective academic advisor.

Here you will find the form "Certificate of fulfilment of the requirements for admission in accordance with the study qualification rules (Studienqualifikationssatzung)".

The study qualification rules (Studienqualifikationssatzung) can be found at www.stud.service.uni-kiel.de/sta/0-1-3.pdf.

6. Application and registration

Admission restrictions

Students may only start the degree programme in the winter semester.

The degree programme is without restricted admission (no compulsory application procedure) in the first and later semesters.

Information about registration.

Please note

The deadlines for registering for the aptitude tests can be many months before the actual registration period! For details of which degree programmes are affected, as well as links to the department websites for the degree programmes in question, please refer to this list.

Note:

Please note the requirements specified in Section 5.

Contact
Here you will find information on admission to Master’s degree programmes, registration and application periods, online registration, as well as confirming your return and leaves of absence.

Further information can be obtained from Student Admission and Registry.

Foreign students with queries regarding admission, registration and advice should contact the International Center.

7. Advice

Academic Advisors

Should you have any subject/course-specific queries, please contact the Academic Advisors.

Subject area: Crop Science and Plant Breeding

Prof. Dr Christian Jung  
Institute of Crop Science and Plant Breeding  
Room 901a, Am Botanischen Garten 1-9  
24118 Kiel  
Tel.: +49 (0)431/880-7364  
E-mail: c.jung@plantbreeding.uni-kiel.de  
Consultation hours: by appointment

Subject area: Animal Breeding and Husbandry

Prof. Dr Georg Thaller  
Institute of Animal Breeding and Husbandry  
Room 115, Hermann-Rodewald-Strasse 6  
24118 Kiel  
Tel: +49 (0)431/880-7329  
E-mail: gthaller@tierzucht.uni-kiel.de  
Consultation hours: by appointment

Office:

Dean’s Office: Faculty of Agricultural and Nutritional Sciences  
Hermann Rodewald-Str. 4  
24118 Kiel  
Tel: +49 (0)431/880-2591

We recommend that first-semester students and students changing subject, in particular, seek academic advice.

Here you will find the list of all Academic Advisors.

Zentrale Studienberatung – Central Academic Advisors

Students and prospective students can obtain information about all of Kiel University’s subjects and degree programmes at the Zentrale Studienberatung.
This centre assists with personal queries relating to degree and career orientation, subject combinations, degree programme structure, changing subject or university, taking a break from or terminating studies, general examination preparation, as well as study-related problems. It also provides students and prospective students with information on careers and areas of employment, further qualifications, postgraduate and supplementary studies or alternatives to studying, and has detailed information sheets on a wide variety of topics.

Zentrale Studienberatung at Kiel University
Christian-Albrechts-Platz 5 (extension to the university tower building)
24118 Kiel

Tel.: +49 (0)431/880-7440
E-mail: zsb@uv.uni-kiel.de
Website: Zentrale Studienberatung – Central Academic Advisors

Office hours: see Zentrale Studienberatung – Central Academic Advisors

Studying without barriers

The officer for students with a disability/chronic illness advises students and those interested in studying for a degree on aspects related to admission, studying and learning conditions in order to realise equal participation in studying.

Officer for students with a disability/chronic illness
Dagny Streicher
Zentrale Studienberatung der Christian-Albrechts-Universität zu Kiel
(Kiel University’s Central Academic Advisors)
Christian-Albrechts-Platz 4, Room 1407
24118 Kiel

Tel.: +49 (0)431/880-5885
E-mail: barrierefrei-studieren@uv.uni-kiel.de
Website: Studying without barriers

Office hours: see Studying without barriers

International Center

Foreign students with queries regarding admission, registration and advice should contact the International Center.
The relevant contacts can be found on the International Center’s website.

International Center
Westring 400
24118 Kiel

Tel.: +49 (0)431/880-3715
Website: www.international.uni-kiel.de

Office hours: see website
**Career Center**

The Career Center assists students and graduates by providing seminars, presentations, advice and coaching relating to career orientation and planning.

Career Center at Kiel University  
Claudia Fink  
Leibnizstraße 3  
24118 Kiel

Tel.: +49 (0)431/880-1251  
E-mail: careercenter@uv.uni-kiel.de  
Website: Career Center

Open consultation times for simple queries and scheduling appointments:  
Wednesdays from 11:30 to 12:30

**Graduate Center**

Kiel University supports its doctoral students centrally via its Graduate Center throughout the course of their doctoral degrees. The Graduate Center is where they can obtain information on all aspects of their doctoral degree, advice on funding opportunities, interdisciplinary qualifications, assistance with networking and exchange with other doctoral students, as well as helpful advice on specific queries.

Graduate Center at Kiel University  
Leibnizstraße 3  
24118 Kiel

Tel.: +49 (0)431/880-3218  
E-mail: info@gz.uni-kiel.de  
Website: Graduate Center

Office hours:

Thursdays from 2pm to 6pm (appointments via e-mail: consulting@gz.uni-kiel.de)

8. **Orientation events for new students**

Induction and orientation events are held at the start of each semester. We recommend attending these.

*Here you can find dates and further information on the induction and orientation events.*

For basic advice and help putting together your curriculum please refer to the *flyer "Tipps zur Erstellung des Stundenplans (tips on producing your curriculum)".*

9. **Examination Office and examination regulations**

Legal provisions governing the degree programme can be found in the following examination regulations:
10. Structure of the degree programme

The subject AgriGenomics can be studied as a 1-subject Master’s degree programme totalling 120 ECTS credits.

The degree programme is made up of one and a half years of advanced scientific study modules, totalling 90 ECTS credits and approximately 62 contact hours per week per semester (SWS), as well as six months in which to produce a final thesis (Master’s thesis, 27 ECTS credits) and the Master’s thesis seminar module (3 ECTS credits).

The Master’s degree programme in AgriGenomics includes nine compulsory modules and compulsory elective modules totalling 42 ECTS credits.

Depending on their average achieved grade, Master of Science graduates may go on to take a doctoral degree.

The module examination serves to determine whether the student has achieved the module's learning objectives. Module examinations are held in parallel to studies and may comprise one or several examinations. The type and number of examinations are set out in the degree-specific examination regulations.

The Master’s examination is passed if all of the module examinations required under the degree-specific examination regulations and the Master’s thesis are passed and therefore the required number of ECTS credits (LP) has been obtained.

The standard period of study for the 1-subject Master’s degree programme in AgriGenomics is 4 semesters.
### Information about the modules

<table>
<thead>
<tr>
<th>Module code</th>
<th>Module name</th>
<th>PL</th>
<th>in sem.</th>
<th>SWS</th>
<th>LP</th>
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<td>AEF-agrig001</td>
<td><strong>Introduction to Molecular Biology</strong></td>
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<td><strong>Organization and Analysis of Eukaryotic Genomes</strong></td>
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<td><strong>Introduction to Crop and Animal Breeding</strong></td>
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Applications of Genomics in Phytopathology (VL)  
Computational and Comparative Genomics (VL)  
Computational and Comparative Genomics (Ü)  
Master's Thesis Seminar (Research Seminar)  
Master’s thesis [6] (26 weeks)  
Total  

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Footnotes

[1] PL = Prüfungsleistung = the examinations to be taken within the framework of the module.

[2] Semesterwochenstunde (SWS): = the number of 45-minute teaching units per week assigned to a particular course for the period of one semester. “2 SWS” means e.g. that this particular course will be held for 2 units per week for an entire semester.

[3] LP = Leistungspunkte = In accordance with the European Credit Transfer and Accumulation System (ECTS), a certain number of credits (LP) are awarded for each module examination passed. Other possible abbreviations include CP and PP. Various academic achievements, for example, preparatory work and follow-up work as well as attending lectures are recognised as workload. One credit point corresponds to a workload of 25 to a maximum of 30 hours of attendance and independent study.

[4] Only one of the three courses must be taken.

[5] The Master’s degree programme includes compulsory elective modules worth a total of 42 LP.

Overview of the compulsory elective modules

[6] Students who have obtained at least 60 ECTS credits from module examinations may be admitted to a Master’s thesis.

Explanations:

Exk.: Exkursion = field trip
HA: Hausarbeit = assignment
j.n.M.: je nach Modul = depending on the module
K: Klausur = written examination
M: mündliche Prüfung = oral examination
P: Praktikum = practical
Pro.: Protokoll = protocol
11. Accreditation

Information on accreditation will follow shortly.