University of Tübingen – Faculty of Science

Courses taught in English, Summer Semester 2017

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Biochemistry – Bachelor
**Course title:** Intership Cellular Biology and Signalling (4027)  (Course number: S3WPM15D)
**Link:** http://campus.uni-tuebingen.de/20171e146687
**Course type:** Block Course
**Contact hours:** 6
**Course coordinator:** o. Prof. Dr. rer. nat. Thorsten Nürnberg, Prof. Dr. rer. nat. Georg Felix, Dr. rer. nat. Birgit Kemmerling, PD Dr. rer. nat. Andrea Gust, PD Dr. rer. nat. Frédéric Brunner, N.N.
**Target audience**
B.Sc. in Biochemistry or M. Sc. in Biology

**Course description**
Introduction into modern molecular methods of cell biochemistry and signalling with the model system of plant/pathogen interaction Introduction into independent lab work and planning of experiments, team work (groups of two), presentation of the experimental results in English

**Course title:** Bioinformatics for Life Scientists  (Course number: BIOINF1910)
**Link:** http://campus.uni-tuebingen.de/20171e150726
**Course type:** Lecture/Excercises
**Contact hours:** 3
**Course coordinator:** o. Prof. Dr.-Ing. Oliver Kohlbacher
**Target audience**
2nd year students

**Course title:** Science of cooking  (Course number: S1WPM15O)
**Link:** http://campus.uni-tuebingen.de/20171e150275
**Course type:** Block Course
**Contact hours:**
**Course coordinator:** Prof. Ph.D. Ana Jesús Garcia-Sáez, Dr. rer. nat. Jakob Suckale
**Target audience**
B. Sc. Biochemistry, 3. year M. Sc. Biochemistry No free places are available.

**Prerequisites**
The participants should have basic knowledge of mathematics, physics and biochemistry.

**Course description**
History of science and cooking, Food components, Basic transformation processes during cooking: phase transitions, Energy, temperature and heat transfer; Elasticity and texture; Diffusion and spherification; Viscosity and polymers; Emulsions and foams; Baking and Fermentation. Applications in Haute Cuisine and food industry.

Instructor: Dr. Della David Protein Aggregation and Aging German Center for Neurodegenerative Diseases (DZNE) Paul-Ehrlich-Str. 17 D-72076 Tuebingen Germany Tel: 07071-9387373 (office) 07071-9387376 (lab) 07071-9387369 (fax) e-mail: Della.David@dzne.de http://www.dzne.de/en/sites/tuebingen/research-groups/david.html

**Biology – Bachelor of Science**

**Course title:** Advanced Animal Evolutionary Ecology I (3116)
**Link:** http://campus.uni-tuebingen.de/20171e149733
**Course type:** Block Course
**Contact hours:**
**Course coordinator:** Dr. rer. nat. Nils Anthes, Ph.D. Pierre-Paul Bitton, M.Sc. Ulrike Harant, o. Prof. Dr. rer. nat. Nico K. Michiels
**Target audience**
Course description
This 6CP (ECTS) module is available to 3rd year Bachelor students to combine multiple small courses or seminars that by themselves cannot be accepted as individual modules within the current BSc Biology system. These small courses must in total comply to the requirements for 6 credit points. Generally, we can accept courses offered (i) within the Animal Evolutionary Ecology group, (ii) within the Institute for Evolution and Ecology or the Evolution and Ecology Forum Tübingen, (iii) within the university of Tübingen, or (iv) from other national or international universities. Courses should generally be marked, and connected to an explicit work load expressed in credit points (ECTS). Moreover, it is required that the courses show connections to research or teaching that is usually offered within our group. Hence, if interested in combining several small courses into our Advanced module, please contact any of the indicated supervisors well in time.

Additional information
http://www.evoeco.uni-tuebingen.de

Course title: Excursion: Neotropic diversity of adaptations, a glance through plant physiology and plant-animal interactions
Link: http://campus.uni-tuebingen.de/20171e150841
Course type: Practical Field Course
Contact hours:
Course coordinator: Prof. Dr. rer. nat. Jan Benda, o. Prof. Dr. rer. nat. Klaus Harter
Target audience
Bachelor students in Biology and Geocology in at least the third study year (all basic modules have to be completed successfully); Master students in Biology and Geocology; PhD students in Biology and Geocology
Course description
In this course students will learn about the primary motors for biological diversification regarding plant physiology and interactions with animals throughout different ecosystems of Colombia. We aim to observe and discuss the interface of Plant-Animal-Human interactions across different landscapes and ecosystems, highlighting the importance of each player within these relationships. By means of field observations we will also address following phenomena: - How the geospatial location of Colombia and its geological conditions allow a great diversity in species and physiological adaptations that can be observed all across the country. - How this great pool of genetic variation and abundance of physiological adaptations make it a unique batch of resources for food production, livestock, pharmacy, raw material industries and ground research.

Course title: Excursion: Tropical Marine Ecology (3066)
Link: http://campus.uni-tuebingen.de/20171e149730
Course type: Block Course
Contact hours:
Course coordinator: o. Prof. Dr. rer. nat. Nico K. Michiels, M.Sc. Ulrike Harant
Target audience
Phd students; Lehramt/Bachelor/Master students in Biology, Geocology, or related fields.
Course description
INFOVERANSTALTUNG am Mon, 30.01.2017., 17ct, E-Bau Morgenstelle, E5 P43 (Seminar Room 5th Floor) Information and registration to nico.michiels@uni-tuebingen.de and registration via Campus This 4-week block module (6CP) consists of 3 components: (1) Blockseminar (2 days; some time in Summer 2017): During a 2-day block seminar in Tübingen, students present recent research and study approaches with relevance to the biology and ecology of coral reef organisms. Moreover, on a half-day trip to the Wilhelma Zoo in Stuttgart, we will familiarize with the most relevant coral reef fish families. The detailed schedule for the
seminar and Wilhelma excursion will be fixed in agreement with the course participants. (2) 14-day excursion (September 2017) to Mangrove Bay, South of El Qusair, Red Sea (Egypt): During the first 3-4 days, participants familiarize with the coral reef ecosystem, its inhabitants and functional groups, at the highly diverse Mangrove Bay house reef, which includes the full gradient from exposed reef slopes to shallow Mangrove forests. As the central course component, students then develop - based on their own field observations - small independent research projects. Students first formulate a research hypothesis based on their observations, then develop a convincing (observational or experimental) study design to evaluate their hypothesis, and finally collect a statistically meaningful dataset for quantitative analysis. All projects will be extensively and critically discussed and evaluated during daily progress meetings. All research projects (individually or in small teams) will be briefly presented to the hotel guests. The excursions further excludes short trips into the adjacent desert, a visit to the nearby small egyptian town of El Quseir, and a full-day boat trip. All projects will be performed on snorkelling. SCUBA diving is possible, but not required. Participants with a diving certificate and insurance can dive (usually, the majority of students does not dive). (3) Post-excursion practical (dates to be agreed upon, some time in October depending on student schedules at the beginning of the winter term): We will jointly analyze the data collected during the field trip. All participants finally develop a short scientific paper to report about their project. The course block will be completely taught in English. All students interested in this excursion must informally register as soon as possible starting 31 January until 31 March 2017 via the Campus website. This registration is initially not binding - but you will then automatically be kept updated about final registration procedures. Given that booking with the travel agent needs to fixed very soon, early registrants have a higher likelihood to be accepted for the course! Costs: For students immatriculated at Tübingen university, we can offer the course at € 900,-pp. This price includes travel & visum, accommodation (twin rooms), extensive half-board catering, on-site snorkeling and a 1-day boat-trip. The price is subsidized by the university and the Animal Evolutionary Ecology group. The price excludes lunches & drinks (expect ~50-90 € in total pp), rental of snorkeling gear if necessary (wetsuits for free rent at our department). We recommend purchasing your own snorkel, mask and open water fins incl. neoprene booties), scuba diving (= expect 20 € per dive) + required gear. For further information, you may also contact the course provider.

Additional information
http://www.evoeco.uni-tuebingen.de/

Course title: Mass Spectrometry-Based Proteomics (4104)
Link: http://campus.uni-tuebingen.de/20171e150592
Course type: Block Course
Contact hours:
Course coordinator: Prof. Dr. rer. nat. Boris Macek
Target audience
Bachelor - 3rd year students: Biology, Biochemistry, Bioinformatics
Course description
Practical course in preparation for a Bachelor Thesis. Duration: 8 weeks, by appointment
Additional information
http://www.proteom-centrum.de/index.php?id=9

Course title: S1 Marine Biology (3169)
Link: http://campus.uni-tuebingen.de/20171e149736
Course type: Block Course
Contact hours: 2
Course coordinator: M.Sc. Ulrike Harant, o. Prof. Dr. rer. nat. Nico K. Michiels, Dr. rer. nat. Nils Anthes
Target audience
Bachelor-, Master-, Diplom-, Lehramt- students in Biology/ Geoecology/ Bioinformatics or related subjects

Course description
The lecture part of this course (2 h / day) gives an introduction to marine ecosystems and is aimed at students interested in marine biology, ecology, and the complexity of marine habitats. The lecture is split into four main blocks: Oceanography General marine ecology Marine habitats Human impact After each lecture there will be a seminar of one hour duration where students present short scientific papers to the class that match the current lecture topics followed by a short discussion (papers will be provided).

Additional information
http://www.evoeco.uni-tuebingen.de/

Course title: S1 Reef Ecology (3178)
Link: http://campus.uni-tuebingen.de/20171e149740
Course type: Block Course
Contact hours: 2
Course coordinator: M.Sc. Ulrike Harant, o. Prof. Dr. rer. nat. Nico K. Michiels

Target audience
Bachelor-, Master-, und Lehramtsstudenten der Fächer Biologie, Geoökologie, Bioinformatik und ähnlicher Fächer. All students interested in reef ecology are welcome! This course offers a good way to prepare yourself for upcoming marine excursions such as Tropical Marine Ecology (Egypt, September 2017) and Marine Biodiversity.

Course description
This course gives a broad overview of reef biology, including:
- Coral biology What are corals? Why are corals interesting? Symbiotic interactions etc.
- Coral reef complexity Insight into the complex interactions among different reef organisms and their environment. How are they connected and why?
- Biodiversity of coral reefs Why are coral reefs so diverse? Where do you find the highest diversity and why exactly there? History of coral reefs When did corals first appear? What did reefs look like 100 My ago? Are corals the only important reef builders in Earth's history?
- Conservation aspects and human impact Threats for this fantastic ecosystem, including global warming, deseases, human foot prints will be discussses. What are coral reefs going to look like in 100 years? In the first 2 weeks of the course 2 h lectures will be given each day addressing the topics mentioned above. After each lecture, we will discuss important new findings in coral reef ecology. This will give the students a solid understanding of the system which can then be applied when working on their own project later on. During the third week, the students will form groups and will focus on how to develop a marine protected area within a specific coral reef area. By combining their knowledge acquired during the course and an intensive literature research, students will identify problems of this area, show what has already be done, what still needs to be done and most importantly how it could be done (in a realistic way). The results of this project phase will then be presented in an oral presentation within the last week of the course.

Course title: Biotic Interactions: Plant-Animal-Interactions (3132)
Link: http://campus.uni-tuebingen.de/20171e150354
Course type: Block Course
Contact hours: 3
Course coordinator: Ph.D. Michal Gruntman

Target audience
MSc Biologie, MSc Geoökologie, Diplom und Bachelor Biologie, Geoökologie, Geographie

Course description
The diversity of plants' shapes, sizes, odors and colors is enormous. Many of these characteristics are directly and indirectly related to strategies for increasing fitness by attracting...
and rejecting animals. Likewise, many animal groups have adapted their behavior and sensory abilities in accordance with the plants characteristics in order to maximize their own fitness. Due to their key role in many ecosystems, understanding of plant-animal interactions at the various organization levels are central to our understanding of the world in which we live. The objective of the course is to introduce the key interactions between plant and animals: herbivory, pollination and seed dispersal and to study how each of them shape both plants and animals from the level of the individual to the ecosystems.

Course title: Advanced Methods in Molecular Biology (3161)
Link: http://campus.uni-tuebingen.de/20171e151794
Course type: Lecture
Contact hours: 6
Course coordinator: Dr. rer. nat. Robert Morbitzer, Dr. rer. nat. Edda Roepenack-Lahaye, o. Prof. Dr. rer. nat. Thomas Lahaye
Target audience
Bachelorstudierende (3. Studienjahr)
Course description
This module aims at providing an overview of modern methods in Molecular Biology. Advanced methods used e.g. for gene cloning, gene expression analysis, genome editing, protein-DNA as well as protein-protein interaction studies will be presented. In the seminar, selected aspects will be discussed in more detail in the context of a Journal club. The lectures, discussions and presentations will be given in English. At the end of the module an exam will be written covering the content of lectures.

Biology – Master

Course title: Intership Cellular Biology and Signalling (Course number: S3WPM15D)
Link: http://campus.uni-tuebingen.de/20171e146687
Course type: Block Course
Contact hours: 6
Course coordinator: o. Prof. Dr. rer. nat. Thorsten Nürnberger, Prof. Dr. rer. nat. Georg Felix, Dr. rer. nat. Birgit Kemmerling, PD Dr. rer. nat. Andrea Gust, PD Dr. rer. nat. Frédéric Brunner, N.N.
Target audience
B.Sc. in Biochemistry or M. Sc. in Biology
Course description
Introduction into modern molecular methods of cell biochemistry and signalling with the model system of plant/pathogen interaction Introduction into independent lab work and planning of experiments, team work (groups of two), presentation of the experimental results in English

Course title: Advanced Animal Evolutionary Ecology II (4064)
Link: http://campus.uni-tuebingen.de/20171e149734
Course type: Block Course
Contact hours: 6
Course coordinator: Dr. rer. nat. Nils Anthes, Ph.D. Pierre-Paul Bitton, M.Sc. Ulrike Harant, o. Prof. Dr. rer. nat. Nico K. Michiels
Target audience
MSc - Evolution und Ökologie
Course description
This 6CP (ECTS) module is available to Master students in Evolution & Ecology to combine multiple small courses or seminars that by themselves cannot be accepted as individual modules within the current MSc system. These small courses must in total comply to the requirements for 6 credit points. Generally, we can accept courses offered (i) within the Animal Evolutionary Ecology...
group, (ii) within the Institute for Evolution and Ecology or the Evolution and Ecology Forum Tübingen, (iii) within the university of Tübingen, or (iv) from other national or international universities. Courses should generally be marked, and connected to an explicit work load expressed in credit points (ECTS). Moreover, it is required that the courses show connections to research or teaching that is usually offered within our group. Hence, if interested in combining several small courses into our Advanced module, please contact any of the indicated supervisors well in time.

**Additional information**
http://www.evoeco.uni-tuebingen.de

**Course title:** Advanced Concepts of Cell Biology [Bio 4076]
**Link:** [http://campus.uni-tuebingen.de/20171e150611](http://campus.uni-tuebingen.de/20171e150611)
**Course type:** Lecture
**Contact hours:**
**Course coordinator:** PD Dr. rer. nat. habil. Bernard Moussian, o. Prof. Dr. rer. nat. Alfred Nordheim, apl. Prof. Dr. rer. nat. Tassula Proikas-Cezanne, o. Prof. Dr. rer. nat. Hans-Georg Rammensee, Prof. Dr. rer. nat. Rolf Reuter, Prof. Dr. rer. nat. Stefan Stevanovic, Jun.-Prof. Ph.D. Alexander Weber, Prof. Dr. rer. nat. Boris Macek

**Target audience**
Studierende des Masters Curriculum “Biologie” Spezielle Zielgruppe: Studierende des MCs Vertiefungsfaches “Molecular Cell Biology & Immunology”

**Prerequisites**

**Course description**
The content of this lecture course builds on the fore-running lecture ‘Concepts in Cell Biology’. Recent progress in essential topics of cell biology will be presented by the lecturers. Topics include: nuclear organisation, cell shape regulation, cell polarity, signal transduction, innate immunity, cancer & immunity, viral infection, cell cycle control, regulatory RNAs, vascular cell biology, stem cell biology and autophagy.

**Additional information**
http://www.pct.uni-tuebingen.de

**Course title:** Advanced Infection Biology
**Link:** [http://campus.uni-tuebingen.de/20171e147295](http://campus.uni-tuebingen.de/20171e147295)
**Course type:** Kurs
**Contact hours:**
**Course coordinator:** Jun.-Prof. Ph.D. Samuel Wagner

**Course description**
The course only takes place in the Summer Semester

**Course title:** Advanced Plant Ecology II (4062)
**Link:** [http://campus.uni-tuebingen.de/20171e150350](http://campus.uni-tuebingen.de/20171e150350)
**Course type:** Block Course
**Contact hours:**
**Course coordinator:** Prof. Dr. rer. nat. Katja Tielbörger, Ph.D. Michal Gruntman, Dr. rer. nat. Jan Ruppert

**Target audience**
MSc Bio / Major Evolution and Ecolgy
**Course description**
This module offers the opportunity to combine several courses, the combined amount of earned credit points should equal 6 ECTS. Only courses with earned credit points (ECTS) can be included. These can be courses (or parts of larger courses) of this group or department, of the EvE (Evolution and Ecology Forum Tübingen), or of other faculties and universities in Germany or abroad. All combinations of course forms are allowed (e.g., lecture, seminar, practical, excursion). As an important prerequisite, all courses that are proposed to be included in this module have to match the general themes of the research and teaching currently done at the Plant Ecology group.

**Course title**: Advanced Seminar “Meet the Expert” [Bio 4003] (Course number: S00SIMMU04)
**Link**: [http://campus.uni-tuebingen.de/20171e149013](http://campus.uni-tuebingen.de/20171e149013)
**Course type**: Seminar
**Contact hours**: 2
**Course coordinator**: o. Prof. Dr. rer. nat. Hans-Georg Rammensee, Prof. Dr. rer. nat. Stefan Stevanovic
**Target audience**: Master Biochemie, Bioinformatik, Biologie, Molekulare Medizin

**Prerequisites**
Completed Bachelor

**Course description**
The seminar accompanies the Institute/SFB-seminar series that is organized by the Institute of Cell Biology (Department of Immunology). Students in pairs (or individually) are responsible for presenting the work of the guest speaker in advance. They are expected to participate actively in the discussion of the lecture. Vorbesprechung für MSc-Studierenden ausnahmsweise am DIENSTAG, 18.04.2017, 17.15 Uhr im Hörsaal N04, HSZ

**Course title**: Advanced Seminar II: Principles of Innate and Adaptive Immunology (4207)
**Link**: [http://campus.uni-tuebingen.de/20171e149037](http://campus.uni-tuebingen.de/20171e149037)
**Course type**: Seminar
**Contact hours**: 2
**Course coordinator**: Jun.-Prof. Ph.D. Alexander Weber
**Target audience**: Studiengang MCBI PhD Programme Experimental Medicine MSc Molekulare Medizin, Biochemie, Biologie

**Prerequisites**
Bachelor Degree

**Course title**: Analysing Publications: Literature Seminar of Molecular Cell Biology [Bio 4114]
**Link**: [http://campus.uni-tuebingen.de/20171e151280](http://campus.uni-tuebingen.de/20171e151280)
**Course type**: Seminar
**Contact hours**: 2
**Course coordinator**: o. Prof. Dr. rer. nat. Alfred Nordheim, apl. Prof. Dr. rer. nat. Tassula Proikas-Cezanne
**Target audience**: Students of the MSc Program “Molecular Cell Biology & Immunology”.

**Prerequisites**
Basic knowledge of molecular cell biology

**Course description**
**Course title**: Autophagy & Longevity - Vorlesung + Seminar [Bio 4073]  
**Link**: http://campus.uni-tuebingen.de/20171e151270  
**Course type**: Lecture/Excercises  
**Contact hours**:  
**Course coordinator**: apl. Prof. Dr. rer. nat. Tassula Proikas-Cezanne  
**Target audience**  
Wahlpflichtmodul - geeignet für Studierende aus folgenden Fächern: Biologie, Biochemie, Molekulare Medizin. Master students (biology, biochemistry, molecular medicine). Master students specializing in cell biology/immunology are encouraged to attend. BSc students with a particular interest in autophagy are also welcome.  
**Prerequisites**  
BSc in biology, biochemistry, molecular medicine. Exceptions possible upon request (email tassula.proikas-cezanne@uni-tuebingen.de).  
**Course description**  
This lecture and seminar series (6 CP) will provide an in-depth introduction to the process of autophagy, focusing on the role of autophagy in longevity and age-related human diseases (such as cancer, neurodegeneration).

**Course title**: Cells on Drugs Inhibitors and Mutants in Cell Biology  
**Link**: http://campus.uni-tuebingen.de/20171e146627  
**Course type**: Block Course  
**Contact hours**:  
**Course coordinator**: Dr. rer. nat. Sandra Richter  
**Target audience**  
Master Biologie  
**Course description**  
Vesicle trafficking is important for the viability and development of all organisms. Chemical inhibitors are potent tools in cell biology as they allow the analysis of different trafficking routes and facilitate the localization of proteins. In this module, students will use confocal laser scanning microscopy to learn which trafficking routes exist in plants and which inhibitors can be used to block them. Furthermore, physiological experiments will demonstrate how crucial vesicle trafficking is.

**Course title**: Comparative innate immunity in animals and plants, Themenmodul 4026  
**Link**: http://campus.uni-tuebingen.de/20171e146683  
**Course type**: Lecture/Excercises  
**Contact hours**: 3  
**Course coordinator**: o. Prof. Dr. rer. nat. Thorsten Nürnberger, Prof. Dr. rer. nat. Georg Felix, PD Dr. rer. nat. Andrea Gust, Dr. rer. nat. Birgit Kemmerling  
**Target audience**  
M.Sc. in Biochemistry or Biology  
**Prerequisites**  
Lecture in the preceding winter semester.  
**Course description**  
Module comprises a lecture, seminar and tutorial. The lecture (winter semester) concerns current topics of innate immunity in animals and plants. The seminar (summer semester) consolidates the topics covered in the lecture by using original publications. Content of the tutorial (summer semester) will be writing of a research proposal based on the original publications covered in the seminar. The seminar and tutorial will take place in the summer semester. Final schedule for the seminar and the discussion of proposals within the tutorial will be according to agreement.

**Course title**: Compulsory module: Current Topics in Plant Physiology 4018
Link: http://campus.uni-tuebingen.de/20171e150490
Course type: Lecture
Contact hours: 3.5
Course coordinator: Dr. rer. nat. Christina Chaban, Dr. rer. nat. Nina Jaspert, Dr. rer. nat. Virtudes Mira-Rodado, o. Prof. Dr. rer. nat. Klaus Harter
Target audience
1st - 3rd master’s semester
Prerequisites
None
Course description
Module content: Lecture on current topics in molecular plant physiology, accompanied by in-depth study of original works on these topics in the literature seminar; insight into current research in the molecular physiology of plants

Course title: Compulsory module: Molecular Plant Physiology I 4019
Link: http://campus.uni-tuebingen.de/20171e150489
Course type: Block Course
Contact hours: 4
Course coordinator: o. Prof. Dr. rer. nat. Klaus Harter, Dr. rer. nat. Nina Jaspert, Dr. rer. nat. Virtudes Mira-Rodado, Dr. rer. nat. Christina Chaban
Target audience
1st - 3rd master’s semester
Prerequisites
BSc in Biology, Biochemistry or subjects related to Biology basic knowledge of lab work required
Course description
Introduction to molecular plant physiology encompassing a variety of methods and techniques

Course title: Current Topics in Proteome Research (Schiene Fr) (4156)
Link: http://campus.uni-tuebingen.de/20171e150591
Course type: Seminar
Contact hours:
Course coordinator: Prof. Dr. rer. nat. Boris Macek, Ph.D. Nicolas Nalpas
Target audience
The target group are M.Sc. students (NOT those from Cell Biology/Immunology) and Ph.D. students.
Course description
Proteomics investigates global qualitative and quantitative changes of protein expression in cells, tissues or whole organisms and represents one of the youngest fields of molecular biology and medicine. Aim of this course is to acquaint the participants with current, high-impact research literature from the field of proteome research and biology. The participants will take turns with active researchers from the field (PCT group members) and will have to present and discuss a research paper from one of the fields: proteogenomics, phosphoproteomics, global analysis of signal transduction, key technology developments, sample preparation and enrichment protocols, microbial proteomics. The target group are M.Sc. students (NOT those from Cell Biology/Immunology) and Ph.D. students.

Course title: Elective: Advanced-Level Course in Plant Physiology 4031
Link: http://campus.uni-tuebingen.de/20171e150487
Course type: Block Course
Contact hours: 13
Course coordinator: o. Prof. Dr. rer. nat. Klaus Harter, Dr. rer. nat. Christina Chaban, Dr. rer. nat. Nina Jaspert, Dr. rer. nat. Sascha Laubinger, Prof. Dr. rer. nat. Claudia Oecking, Dr. rer. nat.
Virtudes Mira-Rodado, Dr. rer. nat. Markus Albert, Dr. rer. nat. Gabriel Schaaf

**Prerequisites**
A background in molecular plant science is expected

**Course description**
Implementation of a small research project involving a wide spectrum of methods

**Course title:** Evolution and Ecology Seminar
**Link:** http://campus.uni-tuebingen.de/20171e150348

**Course type:** AG/Kolloquium
**Contact hours:** 2

**Course coordinator:** Ph.D. Mark Bilton, Prof. Dr. rer. nat. Katja Tielbörger

**Target audience**
This seminar specifically targets all Tübingen students (undergrad, postgrad) interested in Ecology and Evolution - this is your direct access to learn more about ongoing local research and establish contacts.

**Course description**
This is the scientific colloquium of the Institute for Evolution and Ecology. Speakers are early career researchers as well as senior scientists in the broad fields of Ecology, Biodiversity and Evolution. On the one hand, this is the platform where scientists from within Tübingen (University, Max Planck Institutes) disseminate and share their research topics with a broader audience. On the other hand, we frequently invite external guest speakers to present novel findings and research perspectives. Moreover, it is the place where scientists working in the fields of ecology and evolution meet and discuss their most recent findings.

**Course title:** Excursion: Neotropic diversity of adaptations, a glance through plant physiology and plant-animal interactions
**Link:** http://campus.uni-tuebingen.de/20171e150841

**Course type:** Practical Field Course
**Contact hours:**

**Course coordinator:** Prof. Dr. rer. nat. Jan Benda, o. Prof. Dr. rer. nat. Klaus Harter

**Target audience**
Bachelor students in Biology and Geocology in at least the third study year (all basic modules have to be completed successfully); Master students in Biology and Geocology; PhD students in Biology and Geocology

**Course description**
In this course students will learn about the primary motors for biological diversification regarding plant physiology and interactions with animals throughout different ecosystems of Colombia. We aim to observe and discuss the interface of Plant-Animal-Human interactions across different landscapes and ecosystems, highlighting the importance of each player within these relationships. By means of field observations we will also address following phenomena: - How the geospatial location of Colombia and its geological conditions allow a great diversity in species and physiological adaptations that can be observed all across the country. - How this great pool of genetic variation and abundance of physiological adaptations make it a unique batch of resources for food production, livestock, pharmacy, raw material industries and ground research.

**Course title:** Excursion: Tropical Marine Ecology (3066)
**Link:** http://campus.uni-tuebingen.de/20171e149730

**Course type:** Block Course
**Contact hours:**

**Course coordinator:** o. Prof. Dr. rer. nat. Nico K. Michiels, M.Sc. Ulrike Harant

**Target audience**
Phd students; Lehramt/Bachelor/Master students in Biology, Geocology, or related fields.
Course description
INFOVERANSTALTUNG am Mon, 30.01.2017., 17ct, E-Bau Morgenstelle, E5 P43 (Seminar Room 5th Floor)  Information and registration to nico.michiels@uni-tuebingen.de and registration via Campus This 4-week block module (6CP) consists of 3 components: (1) Blockseminar (2 days; some time in Summer 2017): During a 2-day block seminar in Tübingen, students present recent research and study approaches with relevance to the biology and ecology of coral reef organisms. Moreover, on a half-day trip to the Wilhelma Zoo in Stuttgart, we will familiarize with the most relevant coral reef fish families. The detailed schedule for the seminar and Wilhelma excursion will be fixed in agreement with the course participants. (2) 14-day excursion (September 2017) to Mangrove Bay, South of El Qusair, Red Sea (Egypt): During the first 3-4 days, participants familiarize with the coral reef ecosystem, its inhabitants and functional groups, at the highly diverse Mangrove Bay house reef, which includes the full gradient from exposed reef slopes to shallow Mangrove forests. As the central course component, students then develop - based on their own field observations - small independent research projects. Students first formulate a research hypothesis based on their observations, then develop a convincing (observational or experimental) study design to evaluate their hypothesis, and finally collect a statistically meaningful dataset for quantitative analysis. All projects will be extensively and critically discussed and evaluated during daily progress meetings. All research projects (individually or in small teams) will be briefly presented to the hotel guests. The excursions further excludes short trips into the adjacent desert, a visit to the nearby small egypitian town of El Quseir, and a full-day boat trip. All projects will be performed on snorkelling. SCUBA diving is possible, but not required. Partipants with a diving certificate and insurance can dive (usually, the majority of students does not dive). (3) Post-excursion practical (dates to be agreed upon, some time in October depending on student schedules at the beginning of the winter term): We will jointly analyze the data collected during the field trip. All participants finally develop a short scientific paper to report about their project. The course block will be completely taught in English. All students interested in this excursion must informally register as soon as possible starting 31 January until 31 March 2017 via the Campus website. This registration is initially not binding - but you will then automatically be kept updated about final registration procedures. Given that booking with the travel agent needs to fixed very soon, early registrants have a higher likelihood to be accepted for the course! Costs: For students immatriculated at Tübingen university, we can offer the course at € 900,-pp. This price includes travel & visum, accommodation (twin rooms), extensive half-board catering, on-site snorkeling and a 1-day boat-trip. The price is subsidized by the university and the Animal Evolutionary Ecology group. The price excludes lunches & drinks (expect ~50-90 € in total pp), rental of snorkeling gear if necessary (wetsuits for free rent at our department). We recommend purchasing your own snorkel, mask and open water fins incl. neoprene booties), scuba diving (= expect 20 € per dive) + required gear. For further information, you may also contact the course provider.

Additional information
http://www.evoeco.uni-tuebingen.de/

Course title: Excurision: Sensory Systems in Natural Environments (3150)
Link: http://campus.uni-tuebingen.de/20171e150508
Course type: Exkursion
Contact hours: 6
Course coordinator: Prof. Dr. rer. nat. Jan Benda
Target audience
Master Neurobiologie oder Oekologie oder aehnliches Biologie Bachelor auch moeglich
Course description
Sensory systems and communication behaviors show a large diversity even in closely related species. This diversity results among other things from adaptation to highly specific natural habitats and from evolution of intraspecific communication. Despite that, studies of sensory
systems are usually limited to a small number of established model systems in a few model
species, done in well controlled laboratory conditions with standard stimuli. In our field course we
want to analyze the richness and variability of natural stimuli and interfering noise signals in the
natural habitats. At the same time we want to study behavior and sensory physiology in different
species to see how they use their sensory systems in these environments. Through this
comparative approach we want to send sensory systems from the lab back into their natural
context. The dry meadows of Slovenian Karst boost with high density of different insect species.
There we will focus on the songs and the auditory system of grasshoppers and bush-cricket.
Both behavioral observations and experiments as well as electrophysiological recordings in the
lab and in the field are the focus of the field trip. In addition we will have little projects on vibrational
communication in Cicadinae, insect vision, and filiform sensilla in bugs (Heteroptera). Organizers:
Prof. Jan Benda, University Tübingen, Germany, and Ales Skorjanc, University Ljubljana,
Slovenia.

**Course title:** Frontiers in Plant Ecology

**Link:** [http://campus.uni-tuebingen.de/20171e151875](http://campus.uni-tuebingen.de/20171e151875)

**Course type:** Seminar

**Contact hours:** 2

**Course coordinator:** Prof. Dr. sc. nat. Oliver Bossdorf, Ph.D. Anna Lampei-Bucharová

**Target audience**
MSc in Evolution & Ecology, MSc Geoecology, PhD in ecology or evolutionary biology (e.g.
EVEREST at University of Tübingen or EDGE Track at PhD program of MPI). The course is
particularly suitable for MSc and PhD students interested in plant ecology who already have some
background in ecology and some experience with doing science.

**Course description**
In this course we discuss current research frontiers in plant ecology, based on a cluster of recent
papers for each. Before each semester, the topics are determined bottom-up (suggestions by all,
then voting) by the interested members of the Plant Ecology and Plant Evolutionary group. In the
last year, the frontier topics included e.g. the ecology and evolution of plants in cities, ecological
genomics and epigenomics, the ecology of allelopathic interactions, and big data in plant invasion
biology. In addition to the topic clusters selected a priori, there are also a few “wildcard” dates
where other current papers are discussed in a classic journal-club style.

**Course title:** Fundamentals of Sensorimotor Integration (Mo) (4085)

**Link:** [http://campus.uni-tuebingen.de/20171e150632](http://campus.uni-tuebingen.de/20171e150632)

**Course type:** Lecture

**Contact hours:** 2

**Course coordinator:** apl. Prof. Dr. rer. nat. Uwe Ilg

**Course description**
The lecture provides an overview of sensorimotor integration in the animal kingdom, including
man. One of the hallmarks of sensorimotor integration is the modification of sensory processing
by ongoing executed motor actions. Since many motor actions are consequences of sensory
stimuli, sensorimotor integration can be explained as a closed-loop feed-back system. The
examples presented in the lecture extend from simple reactions and its learning-related
modifications in the marine snail Aplysia to the complex eye movement pattern reflecting
cognitive abilities in humans. The use of sub-human primates in this research is explained and
justified in detail by different examples. On several occasions, basic principles of learning are
addressed; the neuronal substrate of motor learning and adaptation is explained in detail. Tool
use and tool fabrication observed by the Caledonian crows are introduced. The lecture places
special emphasis on the visual system. Nevertheless, examples from other modalities such as the
electric sense, the mechanism of echolocation and the importance of whiskers for prey detection
in blindfolded seals are presented as well.
**Course title:** Gastrointestinal (GI) Mucosal Pathophysiology  (Course number: S01SMMOLMED04)
**Link:** http://campus.uni-tuebingen.de/20171e148478
**Course type:** Seminar
**Contact hours:**
**Course coordinator:** Ph.D. Tamia K. Lapointe

**Prerequisites**
Stud. Mol.Med M.Sc., der Mikrobiologie und der Biochemie

**Course description**
Total workload: 120 h Class time: 45 h (Friday 9:30-12:30, Konferenzraum Virologie, 3. OG, E.-Aulhorn-Str. 6) Self-study: 75 h (5-6 h per week)

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**Course title:** Introduction into Scientific Communication (4057)
**Link:** http://campus.uni-tuebingen.de/20171e150575
**Course type:** Seminar
**Contact hours:** 4
**Course coordinator:** Dr. rer. nat. Simon Heilbronner

**Prerequisites**
1st year Msc in Biology

**Course description**
During this module, participants are acquainted with techniques on how to deal with scientific data. Participants will regularly attend lectures of external speakers taking place on Thursdays 5:15 - 6:30 pm, alternating at seminar rooms in the Biology department (E-building, 3rd floor, N12) and the Medical Microbiology (Elfriede-Aulhorn Str.). At the end of the module, participants are expected to compose a one-page report (including an abstract) for every attended lecture. Therein, the topic of the respective lecture and key results are to be presented and discussed in the light of related literature. Participants are guided in detailing scientific problems, pointing out data and results in a logical and comprehensive way. Lectures are usually announced one or two days in advance. Finally, participants are expected to attend an (inter)national conference and actively participate by presenting a poster as a co-author.

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**Course title:** Lab Internship Innate & Adaptive Immunity [Bio 4042]  (Course number: S07PIMMU01)
**Link:** http://campus.uni-tuebingen.de/20171e149025
**Course type:** Block Course
**Contact hours:** 16
**Course coordinator:** o. Prof. Dr. rer. nat. Hans-Georg Rammensee, Prof. Dr. rer. nat. Stefan Stevanovic, Prof. Dr. med. Jan Wehkamp, PD Dr. rer. nat. Stella E. Autenrieth, PD Dr. rer. nat. Cécile Gouttefangeas, Prof. Dr. med. Dipl.-Phys. Gundram Jung, apl. Prof. Dr. rer. nat. Gerd Klein, apl. Prof. Dr. med. Reinhold Klein, apl. Prof. Dr. rer. nat. Oliver Planz, apl. Prof. Dr. rer. nat., Dipl.-Biol. Birgit Schittek, Jun.-Prof. Ph.D. Alexander Weber

**Target audience**

**Prerequisites**
Bachelor Degree

**Course description**
Laborpraktikum Immunologie als Arbeitsgruppenpraktikum mit begleitenden Mitarbeiterseminaren Anfragen an: stefan.stevanovic@uni-tuebingen.de bzw. lynne.yakes@uni-tuebingen.de

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**Course title:** Lab Internship Tumor Immunology [Bio 4051]  (Course number: S07PIMMU02)
Link: http://campus.uni-tuebingen.de/20171e149024  
Course type: Block Course  
Contact hours: 8  
Course coordinator: o. Prof. Dr. rer. nat. Hans-Georg Rammensee, Prof. Dr. rer. nat. Stefan Stevanovic, PD Dr. rer. nat. Stella E. Autenrieth, PD Dr. rer. nat. Cécile Gouttefangeas, PD Dr. med. Ursula Holzer, Prof. Dr. rer. nat. Andreas Peschel, apl. Prof. Dr. rer. nat. Oliver Planz, Prof. Dr. med. Helmut Salihi, Prof. Dr. med., Ph.D. Julia Skokowa, o. Prof. Dr. med. Lars Zender  
Target audience: Studierende der Masterstudiengänge Biologie, Biochemie, Bioinformatik und Molekulare Medizin (1. oder 2. Studienjahr)  
Prerequisites: Bachelor Degree  
Course description: Arbeitsgruppenpraktikum mit begleitenden Mitarbeiterseminaren

Course title: Methodological Frontiers in the Cognitive Neurosciences (Course number: NB04C)  
Link: http://campus.uni-tuebingen.de/20171e150854  
Course type: Seminar  
Contact hours: 2  
Course coordinator: Prof. Dr. rer. nat. Andreas Bartels, apl. Prof. Dr. rer. nat. Christoph Braun, Dr. Marc Himmelbach, apl. Prof. Dr. rer. soc. habil. Hans-Gerhard Klinzing, PD Dr. rer. nat. Axel Lindner, Maren Prass  
Target audience: Students Graduate School of Neural and Behavioural Sciences (MSc) Students Cognitive Science - Cognitive Neuroscience (MSc) Students Biology - Neurobiology (MSc) [Modul ”Einführung in die Neurobiologie”, Anrechnung erfolgt durch Prof. J. Ostwald“ (joachim.ostwald@uni-tuebingen.de)]  

Course title: Modern Methodology in Flow Cytometry  
Link: http://campus.uni-tuebingen.de/20171e150176  
Course type: Block Course  
Contact hours:  
Course coordinator: Dr. Kenneth Berendzen  
Target audience: MSc. 1. - 3. Semester  
Course description: Content: Introduction to flow cytometry The following topics will be subject of this course: Set-up and methodologies for FACS and Flow Cytometry Typical Applications for FACS and Cytometry Quantification of DNA content for cell cycle analysis, endoreduplication Dye Spillover and compensation Sorting (FACS) Own evaluation of own data generated over the course

Course title: Modul Project Conceptualization (4012) (MEEMS)  
Link: http://campus.uni-tuebingen.de/20171e149731  
Course type: Block Course  
Contact hours:  
Course coordinator: o. Prof. Dr. rer. nat. Nico K. Michiels  
Target audience: MSc students in Biology, with specialisation in Evolution and Ecology (compulsory).
**Course description**
This module is compulsory to all MSc students in Evolution and Ecology. Each student has to present two talks in the context of the “Meeting of the Evolution and Ecology Master Students (MEEMS)” which takes place 4 times per year, usually the last Friday before the start of a term and the first Monday after the end of a term. Meetings are always announced to all members of the institute - including all MSc students. Both talks are in English, 20 min max, and should be of a high, international standard. Presentation style, the optimal use of media (powerpoint, video, material, blackboard) or the interaction with the public, are all important. Evaluation is by scientists from all groups within the Institute for Evolution and Ecology. It is a public event to which all are invited, including PhD students etc. MSc students in particular are recommended to attend, even if they are not presenting a talk themselves. During the first talk, students present what they intend to do during their MSc thesis. It can be seen as a kind of grant application, where a project is proposed and defended before data have actually been collected. Hence, the emphasis is on (1) why the subject is interesting and important - in the light of the scientific literature on this subject, (2) what working hypothesis is being tested, (3) how the student intends to collect data (experimental or sampling design) and (4) what the expected outcome is - including alternative results and explanations. Students are NOT expected to present data or results. Pilot studies are NOT necessary. It is also NOT necessary that they present the final ideas about their study - it is perfectly possible that the subject is adjusted after this talk. The feedback of the audience will help to improve the quality of the work. The second talk is presented after the data have been collected and analysed, and preferably after the MSc thesis is finished (but this is not a requirement). Usually this talk will be 6-9 months after the first. Here, introduction and methods are a brief reminder of what you did, but the emphasis is on the data, data analysis, and interpretation of the results - and how this study contributes to the field (relation to other publications).

**Course title:** Current Topics in General Genetics (4014)
**Link:** [http://campus.uni-tuebingen.de/20171e151795](http://campus.uni-tuebingen.de/20171e151795)
**Course type:** Lecture/Excercises
**Contact hours:**
**Course coordinator:** Dr. rer. nat. Andreas Wachter, apl. Prof. Dr. rer. nat. Ulrike Zentgraf, o. Prof. Dr. rer. nat. Thomas Lahaye

**Target audience**
Masterstudierende im 1.-3. Fachsemester

**Course description**

**Course title:** S1 Experimental Design
**Link:** [http://campus.uni-tuebingen.de/20171e149729](http://campus.uni-tuebingen.de/20171e149729)
**Course type:** Block Course
**Contact hours:**
**Course coordinator:** Ph.D. Pierre-Paul Bitton, o. Prof. Dr. rer. nat. Nico K. Michiels, Dr. rer. nat. Nils Anthes

**Target audience**
Master’s degree programs of the Department of Biology, if applicable related degree courses of sciences or medicine

**Prerequisites**
Competent knowledge of Biology

Course description
Through the presentation of pre-existing examples and ideas developed by the students, this module will emphasize the central importance of formulating strong hypotheses which are to be addressed by conducting well planned and executed experimental/sampling designs. The module is taught entirely in English.

Course title: S1 Marine Biology (3169)
Link: http://campus.uni-tuebingen.de/20171e149736
Course type: Block Course
Contact hours: 2
Course coordinator: M.Sc. Ulrike Harant, o. Prof. Dr. rer. nat. Nico K. Michiels, Dr. rer. nat. Nils Anthes

Target audience
Bachelor-, Master-, Diplom-, Lehramt- students in Biology/ Geoecology/ Bioinformatics or related subjects

Course description
The lecture part of this course (2 h / day) gives an introduction to marine ecosystems and is aimed at students interested in marine biology, ecology, and the complexity of marine habitats. The lecture is split into four main blocks: Oceanography General marine ecology Marine habitats Human impact After each lecture there will be a seminar of one hour duration where students present short scientific papers to the class that match the current lecture topics followed by a short discussion (papers will be provided).

Additional information
http://www.evoeco.uni-tuebingen.de/

Course title: S1- Molecular Mouse Genetics for MSc students [Bio 4132]
Link: http://campus.uni-tuebingen.de/20171e151281
Course type: Block Course
Contact hours:
Course coordinator: o. Prof. Dr. rer. nat. Alfred Nordheim, Dr. rer. nat. Siegfried Alberti, PD Dr. rer. nat. Thomas Ott
Target audience
Studierende im Master Studiengang “Molecular Cell Biology & Immunology”
Prerequisites
Prior qualification: BSc degree in Life Sciences (Biology, Biochemistry, Molecular Medicine).
Course description
Das Modul vermittelt mit Hilfe von Vorlesungen, Seminarvorträgen und praktischen Arbeiten die fortgeschrittenen Grundlagen der Molekularen Genetik mit Schwerpunkt der Genetik der Maus

Course title: S1 Reef Ecology (3178)
Link: http://campus.uni-tuebingen.de/20171e149740
Course type: Block Course
Contact hours: 2
Course coordinator: M.Sc. Ulrike Harant, o. Prof. Dr. rer. nat. Nico K. Michiels
Target audience
Bachelor-, Master-, und Lehramtsstudenten der Fächer Biologie, Geoökologie, Bioinformatik und ähnlicher Fächer. All students interested in reef ecology are welcome! This course offers a good way to prepare yourself for upcoming marine excursions such as Tropical Marine Ecology (Egypt, September 2017) and Marine Biodiversity.
Course description
This course gives a broad overview of reef biology, including: Coral biology What are corals?
Why are corals interesting? Symbiotic interactions etc. - Coral reef complexity Insight into the complex interactions among different reef organisms and their environment. How are they connected and why? - Biodiversity of coral reefs Why are coral reefs so diverse? Where do you find the highest diversity and why exactly there? - History of coral reefs When did corals first appear? What did reefs look like 100 My ago? Are corals the only important reef builders in Earths history? - Conservation aspects and human impact Threats for this fantastic ecosystem, including global warming, deseases, human foot prints will be discusses. What are coral reefs going to look like in 100 years? In the first 2 weeks of the course 2 h lectures will be given each day adressing the topics mentioned above. After each lecture, we will discuss important new findings in coral reef ecology. This will give the students a solid understanding of the system which can then be applied when working on their own project later on. During the third week, the students will form groups and will focus on how to develop a marine protected area within a specific coral reef area. By combining their knowledge acquired during the course and an intensive literature research, students will identify problems of this area, show what has already be done, what still needs to be done and most importantly how it could be done (in a realistic way). The results of this project phase will then be presented in an oral presentation within the last week of the course.

Course title: S2 Cell Differentiation [Bio 4140]
Link: http://campus.uni-tuebingen.de/20171e153333
Course type: Block Course
Contact hours:
Course coordinator: PD Dr. rer. nat. habil. Bernard Moussian
Course description
In diesem Modul sollen verschiedene Differenzierungsmechanismen unter anderem beim Modelorganismus Drosophila melanogaster studiert werden. Entsprechende Themen werden dabei historisch anhand von Publikationen abgegrenzt. Dabei ist es wichtig die Fragestellungen zu erkennen und zu formulieren, die zugrundeliegenden Daten zu verstehen und einzuordnen und die Schlussfolgerungen zu ziehen. Über die einzelnen Schritte werden die Student/innen täglich in Form von kurzen Zusammenfassungen (300 Wörter) berichten. Gemeinsam mit einem Abschlussbericht wird die Note ermittelt.

Course title: S3 Proteomics of Cell Signaling [Bio 4077]
Link: http://campus.uni-tuebingen.de/20171e150618
Course type: Block Course
Contact hours: 6
Course coordinator: Prof. Dr. rer. nat. Boris Macek, Ph.D. Nicolas Nalpas
Target audience
The module is offered to the M.Sc. students specializing in Molecular Cell Biology/Immunology (MCB/II)
Prerequisites
Course description
This Module covers the basic principles of biological signal transduction and methodology used to analyze it at the protein level. Special emphasis will be given to the biosynthesis, biology and analysis of posttranslational modifications of proteins as the main mediators of signal transduction. The seminar will cover the key literature from the field of biological signal transduction and proteomics. The practical course will provide a hands-on-experience in acquiring and analyzing large quantitative phosphoproteome datasets.
Additional information
http://www.pct.uni-tuebingen.de/
Course title: Introduction to R (4134)
Link: http://campus.uni-tuebingen.de/20171e151874
Course type: Block Course
Contact hours: 3
Course coordinator: Prof. Dr. sc. nat. Oliver Bossdorf, Dr. sc. nat. Madalin Parepa
Target audience
BSc, MSc or PhD students in Evolution & Ecology, Geocology, or other biological disciplines
Course description
R is a powerful, flexible, and free software used by many researchers for working with data and doing statistical analyses. Our goal is to introduce its potential, and provide the skills to use this software for statistics and data visualization. The course will cover: Import, manipulate, and save data in the R environment, Understanding 'object-oriented' programming, Basic data visualization, Use R for statistics, Advanced data visualization.

Course title: S4 Molecular Mechanisms of Mechanosensing [Bio 4190]
Link: http://campus.uni-tuebingen.de/20171e153197
Course type: Block Course
Contact hours: 
Course coordinator: Dr. rer. nat. Sven Hülsmann
Target audience
This course targets master students with an interest in cell biology, development, and genetics.
Prerequisites
Preference will be given to students with a basic knowledge of Drosophila genetics and/or confocal microscopy
Course description
Mechanosensing is the ability of cells to sense and react to internal or external mechanical cues. This ability plays a role during cell differentiation and morphogenetic events, in the developing organism and during tissue culture. In this course, students will learn and apply principle cell biological and genetic techniques to elucidate how mechanosensing impinges on cellular behaviour during Drosophila development. In particular, they are investigating how an actin-binding protein might function as a cellular mechanosensor. The course implements problem-based learning, i.e. students work on a small project. Students acquire the theoretical background during lectures and seminars; in practical classes, students test their hypotheses experimentally. The results will be analysed and presented in a short report (with the format of a scientific paper).

Course title: Scientific Writing
Link: http://campus.uni-tuebingen.de/20171e146651
Course type: Seminar
Contact hours: 2
Course coordinator: Dr. rer. nat. Laura Ragni, Dr. rer. nat. Sandra Richter, o. Prof. Dr. rer. nat. Gerd Jürgens
Target audience
Master- and PhD students
Prerequisites
Requirement: scientific laboratory experience (Minimum 2 month lab experience). Knowledge of plant biology.
Course description
How to write scientific manuscripts, grant proposals and reports. Lectures + exercises

Course title: Biotic Interactions: Plant-Animal-Interactions (3132)
Link: http://campus.uni-tuebingen.de/20171e150354
**Course type:** Block Course  
**Contact hours:** 3  
**Course coordinator:** Ph.D. Michal Gruntman  
**Target audience**  
MSc Biologie, MSc Geoökologie, Diplom und Bachelor Biologie, Geoökologie, Geographie  
**Course description**  
The diversity of plants’ shapes, sizes, odors and colors is enormous. Many of these characteristics are directly and indirectly related to strategies for increasing fitness by attracting and rejecting animals. Likewise, many animal groups have adapted their behavior and sensory abilities in accordance with the plants characteristics in order to maximize their own fitness. Due to their key role in many ecosystems, understanding of plant-animal interactions at the various organization levels are central to our understanding of the world in which we live. The objective of the course is to introduce the key interactions between plant and animals: herbivory, pollination and seed dispersal and to study how each of them shape both plants and animals from the level of the individual to the ecosystems.

**Course title:** “A journey through the RNA world: from ribozymes to riboswitches” (4021)  
**Link:** [http://campus.uni-tuebingen.de/20171e151798](http://campus.uni-tuebingen.de/20171e151798)  
**Course type:** Block Course  
**Contact hours:**  
**Course coordinator:** Dr. rer. nat. Andreas Wachter  
**Target audience**  
Themenmodul im Master (2. Semester)  
**Prerequisites**  
Teilnahme an den Grundmodulen “Biomoleküle der Zelle” (BMZ), “Molekulare Biologie I und II” (MBI, MBII) oder vergleichbaren Veranstaltungen  
**Course description**  
This module aims at providing an overview of the functional capacity of RNA elements in viruses, bacteria and eukaryotes. Besides catalytically active RNAs, mainly aspects of RNA-based gene regulatory mechanisms will be discussed. In the wide field of RNA-mediated gene control, topics will be primarily focused on structured mRNA elements including thermosensors and riboswitches. The lecture section will provide an introduction into the various aspects of RNA functions in different cellular processes. In the tutorial and the seminar, selected aspects will be discussed in more detail and general principles will be worked out. The lectures will be given in English, whereas discussions and presentations can be held in German as well. A final written examination will take place on July 21st, 2017 at 10 c.t. at ZMBP, in room6R01 (Besprecher 2).

**Course title:** Essentials of Ecology (4151)  
**Link:** [http://campus.uni-tuebingen.de/20171e151877](http://campus.uni-tuebingen.de/20171e151877)  
**Course type:** Block Course  
**Contact hours:** 4  
**Course coordinator:** Prof. Dr. sc. nat. Oliver Bossdorf  
**Target audience**  
The course is primarily aimed at MSc students in Evolution & Ecology. It is, however, also a good module for students in other MSc programs in biology, MSc students in Geoecology, PhD students who would like to update their knowledge in ecology, or an other interested student in biology.  
**Course description**  
The course will introduce students to some of the big fundamental questions in ecology, and to some current frontier research topics. It consists of a regular theoretical course on Tuesday 16-18, and a seminar on Wednesdays 17-19. The seminar part requires the regular attendance of the EvE Seminar or Hilgendorf lecture on Wednesdays, where scientists from Tübingen or
elsewhere, including scientists from abroad, present their current research. The students are expected to summarize several of the seminars through concept maps, which will be graded. The theoretical course part consists of a mix of lectures and more active group work and covers a range of different ecological concepts, the history of some ecological ideas, and some of the most important current topics in ecological science.

**Course title**: Evolutionary Cognitive Neuroscience (4108)
**Link**: [http://campus.uni-tuebingen.de/20171e150644](http://campus.uni-tuebingen.de/20171e150644)
**Course type**: Lecture/Exercises
**Contact hours**: 4
**Course coordinator**: Prof. Dr. rer. nat. Andreas Nieder

**Target audience**
Students of biology, cognitive science, psychology, and related areas

**Prerequisites**
Knowledge about fundamental neuroscience, behavior and physiology is required.

**Course description**
This 6CP-Module consists of the lecture “Evolutionary Cognitive Neuroscience” (Mo, 4-6 pm) and the seminar “Physiology of Cognition and Behaviour” (Mo, 2-4 pm; see Campus): With a strong emphasis on evolutionary and comparative aspects, the lecture “Evolutionary Cognitive Neuroscience” addresses the behavioural and neural foundations of cognition in the animal kingdom (from insects to humans) from a comparative perspective. Topics comprise: Theory of evolution; evolutionary neuroscience; phylogeny and ontogeny of communication & social cognition; neuroethological model systems of cognition, core knowledge of objects, actions, number, and space. The topic of the seminar “Physiology of Cognition and Behaviour” in the summer term 2016 is “Numerical competence: from behaviour to neurons”. Recent findings from the current literature will be presented and discussed. This seminar aims at elucidating behavioural and neuronal mechanisms and principles giving rise to cognition and complex behaviour.

**Course title**: Physiology of Cognition and Behaviour
**Link**: [http://campus.uni-tuebingen.de/20171e150643](http://campus.uni-tuebingen.de/20171e150643)
**Course type**: Seminar
**Contact hours**: 2
**Course coordinator**: Prof. Dr. rer. nat. Andreas Nieder

**Target audience**
Participants of the Module “Evolutionary Cognitive Neuroscience 4108”. Students of Biology and related areas Master students of Cognitive Science

**Prerequisites**
basic knowledge of animal behavior, psychophysics, and neurophysiology

**Course description**
Topic of summer term 2016: Numerical competence - from behaviour to neurons Recent findings from the current literature will be presented and discussed. This seminar aims at elucidating behavioural and neuronal mechanisms and principles giving rise to numerical cognition as an example for abstract behaviour. General principles of ethology, psychophysics, functional imaging and single-neuron physiology will be discussed using the example of number representations.

**Course title**: Molecular Cell Biology (4024)
**Link**: [http://campus.uni-tuebingen.de/20171e146650](http://campus.uni-tuebingen.de/20171e146650)
**Course type**: Lecture
**Contact hours**: 2
**Course coordinator**: Dr. rer. nat. Christopher Grefen, Dr. rer. nat. Sabine Müller, Dr. rer. nat. Peter Pimpl, Dr. rer. nat. Laura Ragni, o. Prof. Dr. rer. nat. Gerd Jürgens
Target audience

Course description
Überblick über den Stand der Forschung und aktuelle Forschungsthemen in der molekularen Zellbiologie.

Course title: The Hilgendorf Lecture
Link: http://campus.uni-tuebingen.de/20171e149738
Course type: Colloquium
Contact hours: 2
Course coordinator: Dr. sc. nat. Ingmar Werneburg, o. Prof. Dr. rer. nat. Nico K. Michiels, Dr. rer. nat. Nils Anthes

Target audience
Die EvE Hilgendorf Lecture is open for all interested persons.

Course description
Internationally acclaimed external guests present their latest work in the field of Evolutionary Biology and Ecology.

Additional information

Geoecology – Bachelor

Course title: The Hilgendorf Lecture
Link: http://campus.uni-tuebingen.de/20171e149738
Course type: Colloquium
Contact hours: 2
Course coordinator: Dr. sc. nat. Ingmar Werneburg, o. Prof. Dr. rer. nat. Nico K. Michiels, Dr. rer. nat. Nils Anthes

Target audience
Die EvE Hilgendorf Lecture is open for all interested persons.

Course description
Internationally acclaimed external guests present their latest work in the field of Evolutionary Biology and Ecology.

Additional information

Geoecology – Master

Course title: Applied Hydrogeology (Hydrogeological Field Course)
Link: http://campus.uni-tuebingen.de/20171e145625
Course type: Practical Field Course
Contact hours: 3
Course coordinator: Dr. rer. nat. Carsten Leven-Pfister

Course title: Evolution and Ecology Seminar
Course title: GeoEnviron Seminar  
Link: http://campus.uni-tuebingen.de/20171e145678  
Course type: Forschungsseminar  
Contact hours: 2  
Course coordinator: Prof. Dr.-Ing. Olaf A. Cirpka  
Additional information:  
http://www.geo.uni-tuebingen.de/aktuelles/forschungskolloquien-und-seminare.html

Course title: Paleobiology Seminar  
Link: http://campus.uni-tuebingen.de/20171e145622  
Course type: Forschungsseminar  
Contact hours: 1  
Course coordinator: Prof. Dr. Hervé Bocherens

Geosciences – Bachelor

Course title: Earth System Dynamics (ESD) Research Seminar  
Link: http://campus.uni-tuebingen.de/20171e145665  
Course type: Forschungsseminar  
Contact hours: 2  
Course coordinator: Prof. Dr. phil. Todd Ehlers, Dr. rer. nat. Christoph Glotzbach

Course title: Geophysik (V)  
Link: http://campus.uni-tuebingen.de/20171e145522  
Course type: Lecture  
Contact hours: 4  
Course coordinator: Prof. Dr. rer. nat. Erwin Appel

Course title: Hydrogeologie und Wasserwirtschaft im Alpenvorland / Hydrogeology and water management in the alpine foothills  
Link: http://campus.uni-tuebingen.de/20171e151147  
Course type: Practical Field Course  
Contact hours:
Course coordinator: Prof. Dr.-Ing. Olaf A. Cirpka, Dr. rer. nat. Carsten Leven-Pfister

Course title: Paleobiology Seminar  
Link: http://campus.uni-tuebingen.de/20171e145622  
Course type: Forschungsseminar  
Contact hours: 1  
Course coordinator: Prof. Dr. Hervé Bocherens

Course title: The Hilgendorf Lecture  
Link: http://campus.uni-tuebingen.de/20171e149738  
Course type: Colloquium  
Contact hours: 2  
Course coordinator: Dr. sc. nat. Ingmar Werneburg, o. Prof. Dr. rer. nat. Nico K. Michiels, Dr. rer. nat. Nils Anthes  
Target audience  
Die EvE Hilgendorf Lecture is open for all interested persons.  
Course description  
Internationally acclaimed external guests present their latest work in the field of Evolutionary Biology and Ecology.  
Additional information  

Geosciences – Master

Course title: Applied Hydrogeology (Hydrogeological Field Course)  
Link: http://campus.uni-tuebingen.de/20171e145625  
Course type: Practical Field Course  
Contact hours: 3  
Course coordinator: Dr. rer. nat. Carsten Leven-Pfister

Course title: Earth System Dynamics (ESD) Research Seminar  
Link: http://campus.uni-tuebingen.de/20171e145665  
Course type: Forschungsseminar  
Contact hours: 2  
Course coordinator: Prof. Dr. phil. Todd Ehlers, Dr. rer. nat. Christoph Glotzbach

Course title: Field Seminar in Applied Geosciences (Leipzig)  
Link: http://campus.uni-tuebingen.de/20171e145627  
Course type: Practical Field Course  
Contact hours:  
Course coordinator: Dr. rer. nat. Carsten Leven-Pfister, Dr. rer. nat. Holger Weiß

Course title: GeoEnviron Seminar  
Link: http://campus.uni-tuebingen.de/20171e145678  
Course type: Forschungsseminar  
Contact hours: 2  
Course coordinator: Prof. Dr.-Ing. Olaf A. Cirpka  
Additional information  
http://www.geo.uni-tuebingen.de/aktuelles/forschungskolloquien-und-seminare.html
Course title: Hydrogeologie und Wasserwirtschaft im Alpenvorland / Hydrogeology and water management in the alpine foothills  
Link: http://campus.uni-tuebingen.de/20171e151147
Course type: Practical Field Course  
Contact hours:  
Course coordinator: Prof. Dr.-Ing. Olaf A. Cirpka, Dr. rer. nat. Carsten Leven-Pfister

Course title: Paleobiology Seminar  
Link: http://campus.uni-tuebingen.de/20171e145622
Course type: Forschungsseminar  
Contact hours: 1  
Course coordinator: Prof. Dr. Hervé Bocherens

Course title: The Hilgendorf Lecture  
Link: http://campus.uni-tuebingen.de/20171e149738
Course type: Colloquium  
Contact hours: 2  
Course coordinator: Dr. sc. nat. Ingmar Werneburg, o. Prof. Dr. rer. nat. Nico K. Michiels, Dr. rer. nat. Nils Anthes  
Target audience  
Die EvE Hilgendorf Lecture is open for all interested persons.  
Course description  
Internationally acclaimed external guests present their latest work in the field of Evolutionary Biology and Ecology.  
Additional information  

Applied Environmental Geoscience AEG – Master

Course title: Advanced Topics in Flow and Transport (VÜ)  
Link: http://campus.uni-tuebingen.de/20171e151148
Course type: Lecture/Excercises  
Contact hours: 4  
Course coordinator: Prof. Dr.-Ing. Olaf A. Cirpka

Course title: Applied Hydrogeology (Hydrogeological Field Course)  
Link: http://campus.uni-tuebingen.de/20171e145625
Course type: Practical Field Course  
Contact hours: 3  
Course coordinator: Dr. rer. nat. Carsten Leven-Pfister

Course title: Applied Hydrogeology (Hydrogeological Investigation Techniques)  
Link: http://campus.uni-tuebingen.de/20171e145626
Course type: Lecture/Excercises  
Contact hours: 4  
Course coordinator: Dr. rer. nat. Carsten Leven-Pfister
Course title: Contaminant Hydrogeology (VU)
Link: http://campus.uni-tuebingen.de/20171e145619
Course type: Lecture/Excercises
Contact hours: 3
Course coordinator: Dr. rer. nat. Michael Finkel, Prof. Dr. rer. nat. Peter Grathwohl

Course title: Environmental Isotope Chemistry (Inorganic Isotope Chemistry) (VÜ)
Link: http://campus.uni-tuebingen.de/20171e145609
Course type: Lecture/Excercises
Contact hours: 3
Course coordinator: Dr. rer. nat. Heinrich Taubald

Course title: Environmental Microbiology and Geomicrobiology (Environmental Microbiology)
Link: http://campus.uni-tuebingen.de/20171e145671
Course type: Lecture/Excercises
Contact hours: 2
Course coordinator: Dr. rer. nat. Sara Kleindienst

Course title: Environmental Microbiology and Geomicrobiology (Geomicrobiology)
Link: http://campus.uni-tuebingen.de/20171e145670
Course type: Lecture
Contact: 2
Course coordinator: Prof. Dr. rer. nat. Andreas Kappler

Course title: Environmental Modeling II (VÜ)
Link: http://campus.uni-tuebingen.de/20171e145631
Course type: Lecture/Excercises
Contact hours: 6
Course coordinator: Ph.D. Chuanhe Lu

Course title: Field Seminar in Applied Geosciences (Leipzig)
Link: http://campus.uni-tuebingen.de/20171e145627
Course type: Practical Field Course
Contact hours:
Course coordinator: Dr. rer. nat. Carsten Leven-Pfister, Dr. rer. nat. Holger Weiß

Course title: GeoEnviron Seminar
Link: http://campus.uni-tuebingen.de/20171e145678
Course type: Forschungsseminar
Contact hours: 2
Course coordinator: Prof. Dr.-Ing. Olaf A. Cirpka
Additional information
http://www.geo.uni-tuebingen.de/aktuelles/forschungskolloquien-und-seminare.html

Course title: Geostatistics
Link: http://campus.uni-tuebingen.de/20171e145673
Course type: Lecture/Excercises
Contact hours: 2
Course coordinator: Dr.-Ing. Claus Haslauer

Course title: Hydrogeologie und Wasserwirtschaft im Alpenvorland / Hydrogeology and water management in the alpine foothills
Course type: Practical Field Course  
Contact hours: 
Course coordinator: Prof. Dr.-Ing. Olaf A. Cirpka, Dr. rer. nat. Carsten Leven-Pfister

Course title: Lab Course Geomicrobiology  
Link: http://campus.uni-tuebingen.de/20171e151249  
Course type: Practical Course  
Contact hours: 6  
Course coordinator: Prof. Dr. rer. nat. Andreas Kappler, Dr. Sci. Caroline Schmidt

Course title: Teach@Tübingen - Economy and Engineering of Water Resource Management  
Link: http://campus.uni-tuebingen.de/20171e149819  
Course type: Lecture/Excercises  
Contact hours: 3  
Course coordinator: Ph.D. Zeff Harrison B.

Course title: Teach@Tübingen - Geohazards  
Link: http://campus.uni-tuebingen.de/20171e149517  
Course type: Lecture/Excercises  
Contact hours: 3  
Course coordinator: M.Sc. Siohan Whadcoat

Scientific Archaeology – Bachelor

Course title: Experimental and Ethno-Archaeology  
Link: http://campus.uni-tuebingen.de/20171e152673  
Course type: Exercises  
Contact hours: 2  
Course coordinator: Dr. rer. nat. Shira Gur-Arie  
Course description
Understanding the site formation processes that have formed the archaeological record is essential in order to reconstruct past human behavior. Using ethnoarchaeological and experimental approaches can supply beneficial insights and understanding of the natural as well as the anthropological agents of these processes. These approaches, allow us to reconstruct human behavior by bridging the gap between such human actions, taphonomic processes and the resulted archaeological record. This course will provide tools to design, perform and assess experimental and ethnoarcheological studies by reviewing case studies from different contexts including a wide range of archaeological materials and features. During a practicum, each student will be asked to suggest an experiment, providing a hypothesis and design of the methods and analysis. Some of the suggested experiments will be carried out and analyzed in the laboratory.

Course title: Geophysik (V)  
Link: http://campus.uni-tuebingen.de/20171e145522  
Course type: Lecture  
Contact hours: 4  
Course coordinator: Prof. Dr. rer. nat. Erwin Appel

Course title: Introduction to Microarchaeobotany  
Link: http://campus.uni-tuebingen.de/20171e152672
Course type: Block Course
Contact hours:
Course coordinator: Dr. rer. nat. Shira Gur-Arie
Course description
Plants are a major component of almost every environmental setting and anthropological context. Yet, they rarely survive in the macroscopic archaeological record visible to the naked eye. Microscopic plant remains on the other hand do tend to preserve, thus enabling us to extract valuable information on these otherwise absent materials. Micro-archaeobotanical remains such as pollen, starch and phytoliths can reveal information on past environment, as well as on human behavior related to diet, subsistence practices, medicines, construction techniques and much more. In this theoretical and practical course, we will review case studies in microarchaeobotany and their archaeological significance and will learn to perform microbotanical analysis in the laboratory, concentrating mostly on Phytolith analysis.

Course title: Journalclub: Cognition of Tool Use
Link: http://campus.uni-tuebingen.de/20171e154254
Course type: Seminar
Contact hours: 2
Course coordinator: Dr. rer. nat. Claudio Tennie
Course description
This will be a biweekly masters level journal club. The goal of the journal club will be twofold: i) it will be informative, as we will read and discuss in depth key/recent papers on topic and ii) it will practice scientific debate and will practice the skill of condensed paper presentations without the use of PowerPoint (these informal presentations will have to be delivered in less than five minutes - simply to kick off group discussion). Discussions will cover all aspects of a paper, including theoretical framing, study design, methods, and results. Note that this journal club will be in English.

Course title: Laboratory practices in Geoarchaeology and Micromorphology
Link: http://campus.uni-tuebingen.de/20171e152347
Course type: Internship
Contact hours: 2
Course coordinator: Prof. Dr. rer. nat. Christopher Miller, Dipl.-Ing. Panagiotis Kritikakis

Course title: Microfauna from Archaeological Contexts
Link: http://campus.uni-tuebingen.de/20171e150171
Course type: Seminar
Contact hours: 2
Course coordinator: B.A. Chris Baumann, Àngel Blanco-Lapaz, M.Sc. Sarah Rhodes

Scientific Archaeology – Master

Course title: Case studies in archaeological micromorphology
Link: http://campus.uni-tuebingen.de/20171e150168
Course type: Exercises
Contact hours: 2
Course coordinator: Dr. phil. Susan Mentzer, Prof. Dr. rer. nat. Christopher Miller

Course title: Dietary Reconstruction of Fossil Hominids
Link: http://campus.uni-tuebingen.de/20171e154193
Course type: Seminar
Contact hours: 2
Course coordinator: Ph.D. Sireen El Zaatari

Course title: Experimental and Ethno-Archaeology
Link: http://campus.uni-tuebingen.de/20171e152673
Course type: Exercises
Contact hours: 2
Course coordinator: Dr. rer. nat. Shira Gur-Arie

Course description
Understanding the site formation processes that have formed the archaeological record is essential in order to reconstruct past human behavior. Using ethnoarchaeological and experimental approaches can supply beneficial insights and understanding of the natural as well as the anthropological agents of these processes. These approaches, allow us to reconstruct human behavior by bridging the gap between such human actions, taphonomic processes and the resulted archaeological record. This course will provide tools to design, perform and assess experimental and ethnoarchaeological studies by reviewing case studies from different contexts including a wide range of archaeological materials and features. During a practicum, each student will be asked to suggest an experiment, providing a hypothesis and design of the methods and analysis. Some of the suggested experiments will be carried out and analyzed in the laboratory.

Course title: FTIR in Archaeology and Geosciences
Link: http://campus.uni-tuebingen.de/20171e150169
Course type: Seminar
Contact hours: 2
Course coordinator: Dr. phil. Susan Mentzer

Course description
Course will likely take place at the end of May/beginning of June over the course of two weekends.

Course title: GIS for environmental archaeologists: individual project work.
Link: http://campus.uni-tuebingen.de/20171e152312
Course type: Exercises
Contact hours: 2
Course coordinator: Dr. rer. nat. Konstantin Pustovoytov

Course title: Introduction to Microarchaeobotany
Link: http://campus.uni-tuebingen.de/20171e152672
Course type: Block Course
Contact hours:
Course coordinator: Dr. rer. nat. Shira Gur-Arie

Course description
Plants are a major component of almost every environmental setting and anthropological context. Yet, they rarely survive in the macroscopic archaeological record visible to the naked eye. Microscopic plant remains on the other hand do tend to preserve, thus enabling us to extract valuable information on these otherwise absent materials. Micro-archaeobotanical remains such as pollen, starch and phytoliths can reveal information on past environment, as well as on human behavior related to diet, subsistence practices, medicines, construction techniques and much more. In this theoretical and practical course, we will review case studies in microarchaeobotany and their archaeological significance and will learn to perform microbotanical analysis in the laboratory, concentrating mostly on Phytolith analysis.
Course title: Introduction to R: A Crash Course  
Link: http://campus.uni-tuebingen.de/20171e154259  
Course type: Workshop  
Contact hours: 1  
Course coordinator: Ph.D. Mark Walter Grabowski  

Course title: Journalclub: Cognition of Tool Use  
Link: http://campus.uni-tuebingen.de/20171e154254  
Course type: Seminar  
Contact hours: 2  
Course coordinator: Dr. rer. nat. Claudio Tennie  
Course description: This will be a biweekly masters level journal club. The goal of the journal club will be twofold: i) it will be informative, as we will read and discuss in depth key/recent papers on topic and ii) it will practice scientific debate and will practice the skill of condensed paper presentations without the use of PowerPoint (these informal presentations will have to be delivered in less than five minutes - simply to kick off group discussion). Discussions will cover all aspects of a paper, including theoretical framing, study design, methods, and results. Note that this journal club will be in English.  

Course title: Laboratory practices in Geoarchaeology and Micromorphology  
Link: http://campus.uni-tuebingen.de/20171e152347  
Course type: Internship  
Contact hours: 2  
Course coordinator: Prof. Dr. rer. nat. Christopher Miller, Dipl.-Ing. Panagiotis Kritikakis  

Course title: Major Debates in Human Evolution  
Link: http://campus.uni-tuebingen.de/20171e154196  
Course type: Seminar  
Contact hours: 2  
Course coordinator: Ph.D. Mark Walter Grabowski  

Course title: Microfauna from Archaeological Contexts  
Link: http://campus.uni-tuebingen.de/20171e150171  
Course type: Seminar  
Contact hours: 2  
Course coordinator: B.A. Chris Baumann, Àngel Blanco-Lapaz, M.Sc. Sarah Rhodes  

Course title: Microwear Analysis  
Link: http://campus.uni-tuebingen.de/20171e154260  
Course type: Workshop  
Contact hours: 1  
Course coordinator: Ph.D. Sireen El Zaatari  

Course title: NWA-10e-1 Organic Materials  
Link: http://campus.uni-tuebingen.de/20171e153210  
Course type: Lecture  
Contact hours: 2  
Course coordinator: Jun.-Prof. Dr. phil. Cynthiaanne Debono Spiteri  

Course title: NWA-10e-2 Organic Materials  
Link: http://campus.uni-tuebingen.de/20171e153213
Course type: Exercises  
Contact hours: 2  
Course coordinator: Jun.-Prof. Dr. phil. Cynthianne Debono Spiteri

Course title: NWA-5c-1: Palynologie  
Link: http://campus.uni-tuebingen.de/20171e149130  
Course type: Lecture/Exercises  
Contact hours: 2  
Course coordinator: Prof. Dr. rer. nat. Brigitte Urban

Course title: NWA-5e-1 Practical Archaeometry  
Link: http://campus.uni-tuebingen.de/20171e153562  
Course type: Lecture  
Contact hours: 2  
Course coordinator: M.Sc. Silvia Amicone, Dr. phil. Marta Diaz-Zorita Bonilla, Dr. rer. nat. Dorothee Drucker-Bocherens, Jun.-Prof. Dr. phil. Cynthianne Debono Spiteri

Course title: NWA-5e-2 Practical Archaeometry  
Link: http://campus.uni-tuebingen.de/20171e153563  
Course type: Exercises  
Contact hours: 2  
Course coordinator: M.Sc. Silvia Amicone, Jun.-Prof. Dr. phil. Cynthianne Debono Spiteri, Dr. phil. Marta Diaz-Zorita Bonilla, Dr. rer. nat. Dorothee Drucker-Bocherens

Course title: NWA-6a: Environmental archaeology: a global perspective  
Link: http://campus.uni-tuebingen.de/20171e149155  
Course type: Seminar  
Contact hours: 2  
Course coordinator: Dr. rer. nat. Konstantin Pustovoytov

Course title: NWA-8c-2: Spezielle Karpologie  
Link: http://campus.uni-tuebingen.de/20171e149151  
Course type: Exercises  
Contact hours: 2  
Course coordinator: Dr. rer. nat. Simone Riehl  

Course title: NWA-9a: Teilaspekte der Archäozoologie: Diet and subsistence in prehistoric context  
Link: http://campus.uni-tuebingen.de/20171e149158  
Course type: Lecture/Exercises  
Contact hours: 3  
Course coordinator: Dr. rer. nat. Dorothee Drucker-Bocherens, Dr. phil. Britt Starkovich  
Course description: Die Veranstaltung besteht aus einem Teil Vorlesung und einem Teil Seminar. Die Veranstaltungen können einzeln besucht werden. The course consists of a lecture and a seminar. The course elements can be visited separately.

Course title: NWA-9b: Imaging and Morphometrics (V mit Ü)  
Link: http://campus.uni-tuebingen.de/20171e150167
**Course type:** Exercises  
**Contact hours:** 2  
**Course coordinator:** M.Sc. Hugo Reyes-Centeno, Dr. rer. nat. Heike Scherf

**Course title:** NWA-9f-1: Archäo- und Paläogenetik II - Paläogenetik Übung  
**Link:** http://campus.uni-tuebingen.de/20171e149128  
**Course type:** Exercises  
**Contact hours:** 2  
**Course coordinator:** Dr. rer. nat. Verena Schünemann

**Course title:** NWA-9f-2: Archäo- und Paläogenetik II - Analysis of NGS data from ancient DNA.  
**Link:** http://campus.uni-tuebingen.de/20171e149135  
**Course type:** Exercises  
**Contact hours:**  
**Course coordinator:** M.Sc. Judith Neukamm

**Course title:** Paleoecology of Terrestrial Ecosystems  
**Link:** http://campus.uni-tuebingen.de/20171e145623  
**Course type:** Lecture/Exercises  
**Contact hours:** 6  
**Course coordinator:** Prof. Dr. Hervé Bocherens, Dr. rer. nat. Dorothee Drucker-Bocherens, Dr. rer. nat. Christoph Wißing

**Course title:** Teach@Tübingen - Material Science and Archaeological Ceramics: Ancient Pottery and its Pigments  
**Link:** http://campus.uni-tuebingen.de/20171e149285  
**Course type:** Lecture/Exercises  
**Contact hours:** 4  
**Course coordinator:** M.Sc. Silvia Amicone

**Course title:** Terrestrische Ökosysteme - Grabungs- und Laborpraktikum (Isotopenpraktikum)  
**Link:** http://campus.uni-tuebingen.de/20171e149112  
**Course type:** Practical Course  
**Contact hours:**  
**Course coordinator:** Prof. Dr. Hervé Bocherens, Dr. rer. nat. Dorothee Drucker-Bocherens, Dr. rer. nat. Christoph Wißing

**Bioinformatics – Bachelor**

**Course title:** Advanced Topics in Bioinformatics - Computational Microbiome Analysis  (Course number: BIO4399)  
**Link:** http://campus.uni-tuebingen.de/20171e154226  
**Course type:** Lecture/Exercises  
**Contact hours:**  
**Course coordinator:** o. Prof. Dr. math. Daniel Huson  
**Additional information**  
http://ab.inf.uni-tuebingen.de/teaching/sose2017/microbiome

**Course title:** Computational Photography  (Course number: INFO4176)  
**Link:** http://campus.uni-tuebingen.de/20171e150760
Course type: Lecture/Excercises  
Contact hours: 4  
Course coordinator: o. Prof. Dr.-Ing. Hendrik Lensch, B.Sc. Raphael Braun, M.Sc. Jieen Chen  
Additional information  
https://ovidius.uni-tuebingen.de/ilias3/goto.php?target=crs_1418470&client_id=pr02  

Course title: Drug Design 2 (Ligand-based Drug Design)  
Link: http://campus.uni-tuebingen.de/20171e150723  
Course type: Lecture/Excercises  
Contact hours: 2  
Course coordinator: o. Prof. Dr.-Ing. Oliver Kohlbacher, Mitarbeiter, Dr. rer. nat. Philipp Thiel  
Target audience  
3. Studienjahr (BSc), 1. Studienjahr (MSc)  

Course title: Grundlagen der Bioinformatik (AB)  
Link: http://campus.uni-tuebingen.de/20171e150718  
Course type: Proseminar  
Contact hours: 2  
Course coordinator: o. Prof. Dr. math. Daniel Huson, Mitarbeiter  
Prerequisites  
Bachelor-Studenten Bioinformatik im 4. Semester oder Diplomstudenten Bioinformatik, denen noch ein Schein für das Proseminar fehlt.  
Additional information  
http://ab.inf.uni-tuebingen.de/teaching/sose2017/proseminar  

Course title: Systems Biology I - Properties of Reconstructed Networks  
Link: http://campus.uni-tuebingen.de/20171e151763  
Course type: Lecture/Excercises  
Contact hours:  
Course coordinator: Jun.-Prof. Dr. rer. nat. Andreas Dräger  
Prerequisites  
The prerequisite is some knowledge of linear algebra and biochemistry. Through the links between mathematical ideas and biological processes are made clear, the lecture reflects the irreversible trend of increasing mathematical content in biology education. Grundlegende Kenntnisse linearer Algebra und der Biochemie.  
Course description  
Genome sequences are now available that enable us to determine the biological components that make up a cell or an organism. Systems biology examines how these components interact and form networks and how the networks generate whole cell functions corresponding to observable phenotypes. This lecture is an introduction to basic concepts of systems biology devoted to undergraduate students. It describes how to model networks, how to determine their properties, and how to relate these to phenotypic functions.  

Bioinformatics – Master  

Course title: Advanced Statistics  
Link: http://campus.uni-tuebingen.de/20171e151893  
Course type: Lecture  
Contact hours: 2
Course coordinator: Prof. Dr. rer. nat. Volker Franz, Prof. Dr. rer. biol. hum. Steffen Gais
Course description
Please see the detailed course-description at: http://www.ecogsci.cs.uni-tuebingen.de/teach.php
Additional information
http://www.ecogsci.cs.uni-tuebingen.de/teach.php

Course title: Advanced Topics in Bioinformatics - Computational Microbiome Analysis  (Course number: BIO4399)
Link: http://campus.uni-tuebingen.de/20171e154226
Course type: Lecture/Excercises
Contact hours:
Course coordinator: o. Prof. Dr. math. Daniel Huson
Additional information
http://ab.inf.uni-tuebingen.de/teaching/sose2017/microbiome

Course title: Algorithms of Bioinformatics  (Course number: BIOINF4362)
Link: http://campus.uni-tuebingen.de/20171e151761
Course type: Seminar
Contact hours: 2
Course coordinator: Mitarbeiter, apl. Prof. Dr. math. Katja Nieselt
Course description
Topic of the seminar is “The future of next-generation sequencing”. If you are interested in enrolling, please visit the course on ILIAS (https://ovidius.uni-tuebingen.de/llias3/llias.php?ref_id=1431563&cmdClass=ilrepositorygui&cmdNode=0&baseClass=ilrepositorygui). Here we have uploaded a whole zip folder with papers, that we find interesting enough to be studied in this seminar. On the first day of the seminar, April 21, a final decision will be made who will talk about which topic. Students are asked to prepare by studying the papers in the zip folder and coming up with a priority list of topics.
Additional information
https://ovidius.uni-tuebingen.de/llias3/goto.php?target=crs_1416742&client_id=pr02

Course title: Bioinformatics Tools  (Course number: BIOINF4240)
Link: http://campus.uni-tuebingen.de/20171e150719
Course type: Internship
Contact hours: 4
Course coordinator: o. Prof. Dr. math. Daniel Huson, Mitarbeiter

Course title: Building Low-Cost Eye Tracker
Link: http://campus.uni-tuebingen.de/20171e153685
Course type: Internship
Contact hours:
Course description
Dozent: Shahram Eivazi (Teach@Tübingen)
Additional information
http://www.ti.uni-tuebingen.de/Programmierprojekt-Building-Low-Cost-Eye-Tracker.2035.0.html

Course title: Computational Photography  (Course number: INFO4176)
Link: http://campus.uni-tuebingen.de/20171e150760
Course type: Lecture/Excercises
Contact hours: 4
Course coordinator: o. Prof. Dr.-Ing. Hendrik Lensch, B.Sc. Raphael Braun, M.Sc. Jieen Chen
Course title: Datenmanagement für die Quantitative Biologie  (Course number: BIOINF4399C)
Link: http://campus.uni-tuebingen.de/20171e150735
Course type: Lecture/Excercises
Contact hours:
Course coordinator: Mitarbeiter, Dr. rer. nat. Sven Nahnsen

Course title: Drug Design 2 (Ligand-based Drug Design)  (Course number: BIOINF4372)
Link: http://campus.uni-tuebingen.de/20171e150723
Course type: Lecture/Excercises
Contact hours: 2
Course coordinator: o. Prof. Dr.-Ing. Oliver Kohlbacher, Mitarbeiter, Dr. rer. nat. Philipp Thiel
Target audience
3. Studienjahr (BSc), 1. Studienjahr (MSc)

Course title: Flying Robots  (Course number: INF4364)
Link: http://campus.uni-tuebingen.de/20171e150773
Course type: Internship
Contact hours: 4

Course title: Fortgeschrittene Themen aus Computer Graphik und Computer Vision  (Course number: INF4168)
Link: http://campus.uni-tuebingen.de/20171e150758
Course type: Seminar
Contact hours:
Course coordinator: M.Sc. Sebastian Herholz, Dipl.-Inform. Katharina Schwarz

Course title: Gaze-based Interactive Systems
Link: http://campus.uni-tuebingen.de/20171e153684
Course type: Seminar
Contact hours:
Course description
Dozent: Shahram Eivazi (Teach@Tübingen) Details of the seminar see
Additional information

Course title: Intelligent Systems - Machine Learning for Robotics  (Course number: INFO4177)
Link: http://campus.uni-tuebingen.de/20171e150812
Course type: Lecture/Excercises
Contact hours:
Target audience
Master students in Computer Science, Mathematics and Physics and associated fields.
Course description

Course title: Kryptologie  (Course number: INFO4451)
Course title: Machine Learning: Algorithms and Theory  (Course number: INFO4491)
Link: http://campus.uni-tuebingen.de/20171e150810
Course type: Lecture/Excercises
Contact hours:
Course coordinator: Prof. Dr. rer. nat. Ulrike Luxburg
Course description
In many applications and domains, massive amounts of data are collected and processed every day. To be able to make efficient use of such data, there is an urgent need for tools to extract important pieces of information from the flood of unimportant details. Machine learning is a relatively young discipline that tries to deal with this problem, by designing algorithms to analyze large amounts of complex data in a principled way. Machine learning is the core technique in many applications such as spam filtering, object recognition, analyzing user preferences, recommender systems, and so on. Scientific disciplines such as biology, neuroscience, physics, or medicine discover the potential of machine learning methods for analyzing their empirical data. And, last but not least, many large companies like google, Amazon, facebook heavily rely on machine learning techniques. The field of machine learning combines ingredients from several fields: we need to design efficient algorithms to process the amount of data, and we need to ensure that predictions made by machine learning algorithms are statistically sound. The focus of the lecture is on algorithmic and theoretical aspects of machine learning. We will cover many of the standard algorithms, learn about the general principles for building good machine learning algorithms, and analyze their theoretical properties. - Supervised learning problems: Linear methods; regularization; SVMS; kernel methods - Unsupervised learning problems: Dimension reduction (kernel PCA, multi-dimensional scaling, manifold methods); spectral clustering and spectral graph theory - How to model machine learning problems: Bayesian decision theory, loss functions, feature selection, evaluation and comparison of algorithms. Common pitfalls - Online algorithms - Learning theory (no free lunch theorem; generalization bounds; VC dimension; universal consistency; Theorem of Stone) - Low rank matrix methods (collaborative filtering, low rank matrix completion, compressed sensing) The following topics are NOT going to be covered: decision trees, neural networks / deep networks, graphical models, Bayesian approaches to machine learning, reinforcement learning.
Additional information
http://www.tml.cs.uni-tuebingen.de/teaching/index.php

Course title: Machine Learning and Artificial Neural Networks in Biomedical Applications  
(Course number: INFO4192)
Link: http://campus.uni-tuebingen.de/20171e150765
Course type: Seminar
Contact hours:
Course coordinator: Dr. rer. nat. Martin Spüler
Course description
The Seminar “Machine Learning and Artificial Neural Networks in Biomedical Applications” covers current topics of signal processing on neural signals (e.g. fMRI, EEG or MEG) for their use in biomedical applications (e.g. neuroprosthetics or brain-computer interfaces, BCIs) and related topics; as well as methods and algorithms applied in those fields.

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Im Seminar "Maschinelles Lernen und Künstliche
Neuronale Netze in der biomedizinischen Anwendung werden aktuelle Themen aus der Signalverarbeitung im Bereich der Verarbeitung von Nervensignalen (z.B. Neuroprothetik oder Brain-Computer-Interfaces), medizinischer Signalen (z.B.: fMRT oder MEG) oder verwandten Bereichen sowie in diesen Bereichen verwendeten Algorithmen der Signalverarbeitung bearbeitet.

Course title: Machine Learning II (Course number: NIP02B)
Link: http://campus.uni-tuebingen.de/20171e150856
Course type: Lecture/Excercises
Contact hours: 4
Course coordinator: Prof. Dr.-Ing. Martin Giese
Prerequisites: Machine learning I
Course description
After the course, the participants will have a solid understanding of probability logic, Bayesian networks, inference and learning in Bayesian networks and Markov random fields with exact, (variational) EM and sampling methods. Moreover, the course covers modern stochastic process approaches in Machine learning, such as the Gaussian process and dynamical extensions.

Additional information

Course title: Massively Parallel Computing (Course number: INFO4173)
Link: http://campus.uni-tuebingen.de/20171e150759
Course type: Lecture/Excercises
Contact hours: 4
Course coordinator: o. Prof. Dr.-Ing. Hendrik Lensch, Dipl.-Inf. Benjamin Resch, M.Sc. Patrick Wieschollek
Course description
Blockveranstaltung vor Vorlesungsbeginn Vorlesung mit Übungen
Additional information
https://ovidius.uni-tuebingen.de/ilias3/goto.php?target=crs_1401534&client_id=pr02

Course title: Psychophysical Methods
Link: http://campus.uni-tuebingen.de/20171e151708
Course type: Lecture
Contact hours:
Course coordinator: o. Prof. D.Phil. Felix Wichmann
Additional information
http://www.nip.uni-tuebingen.de/teaching/lectures-seminars

Course title: Spezielle Themen der Algorithmik (Course number: INFO4419)
Link: http://campus.uni-tuebingen.de/20171e150769
Course type: Lecture/Excercises
Contact hours:
Course coordinator: Ph.D. Patrizio Angelini, o. Prof. Dr. rer. nat. Michael Kaufmann
Course description
Inhalt: Perlen der Algorithmik

Course title: Structure and Systems Bioinformatics (Course number: BIOINF4120)
Link: http://campus.uni-tuebingen.de/20171e150725
Course type: Lecture/Excercises
Contact hours:
Course coordinator: Mitarbeiter, o. Prof. Dr.-Ing. Oliver Kohlbacher
Target audience
1. Studienjahr

Course title: Visualisation of Biological Data (Course number: BIO4364)
Link: http://campus.uni-tuebingen.de/20171e150734
Course type: Lecture
Contact hours:
Course coordinator: Jun.-Prof. Dr. rer. nat. Julian Heinrich
Course description
As biological datasets increase in size and complexity, we are moving more and more from an hypothesis-driven research paradigm to a data-driven one. As a result, exploration of that data has become even more crucial than in the past. The aim of this lecture is to familiarise the participants with modern visual analytics methodologies applied to biological data and to provide hands-on training during the tutorials. Questions such as what is data visualization, what is visual analytics and how can we visualise biological data to gain insight in them, so that hypotheses can be generated or explored and further targeted analyses can be defined.

Computer Science – Bachelor

Course title: Computational Photography (Course number: INFO4176)
Link: http://campus.uni-tuebingen.de/20171e150760
Course type: Lecture/Excercises
Contact hours: 4
Course coordinator: o. Prof. Dr.-Ing. Hendrik Lensch, B.Sc. Raphael Braun, M.Sc. Jieen Chen
Additional information
https://ovidius.uni-tuebingen.de/ilias3/goto.php?target=crs_1418470&client_id=pr02

Course title: Drug Design 2 (Ligand-based Drug Design) (Course number: BIOINF4372)
Link: http://campus.uni-tuebingen.de/20171e150723
Course type: Lecture/Excercises
Contact hours: 2
Course coordinator: o. Prof. Dr.-Ing. Oliver Kohlbacher, Mitarbeiter, Dr. rer. nat. Philipp Thiel
Target audience
3. Studienjahr (BSc), 1. Studienjahr (MSc)

Course title: Systems Biology I - Properties of Reconstructed Networks (Course number: BIOINF3371)
Link: http://campus.uni-tuebingen.de/20171e151763
Course type: Lecture/Excercises
Contact hours:
Course coordinator: Jun.-Prof. Dr. rer. nat. Andreas Dräger
Prerequisites
The prerequisite is some knowledge of linear algebra and biochemistry. Through the links between mathematical ideas and biological processes are made clear, the lecture reflects the irreversible trend of increasing mathematical content in biology education. Grundlegende Kenntnisse linearer Algebra und der Biochemie.
Course description
Genome sequences are now available that enable us to determine the biological components that make up a cell or an organism. Systems biology examines how these components interact and form networks and how the networks generate whole cell functions corresponding to observable phenotypes. This lecture is an introduction to basic concepts of systems biology devoted to undergraduate students. It describes how to model networks, how to determine their properties, and how to relate these to phenotypic functions.

Computer Science – Master

Course title: Advanced Statistics
Link: http://campus.uni-tuebingen.de/20171e151893
Course type: Lecture
Contact hours: 2
Course coordinator: Prof. Dr. rer. nat. Volker Franz, Prof. Dr. rer. biol. hum. Steffen Gais
Course description
Please see the detailed course-description at: http://www.ecogsci.cs.uni-tuebingen.de/teach.php
Additional information
http://www.ecogsci.cs.uni-tuebingen.de/teach.php

Course title: Building Low-Cost Eye Tracker
Link: http://campus.uni-tuebingen.de/20171e153685
Course type: Internship
Contact hours:
Course description
Dozent: Shahram Eivazi (Teach@Tübingen)
Additional information
http://www.ti.uni-tuebingen.de/Programmierprojekt-Building-Low-Cost-Eye-Tracker.2035.0.html

Course title: Computational Photography (Course number: INFO4176)
Link: http://campus.uni-tuebingen.de/20171e150760
Course type: Lecture/Excercises
Contact hours: 4
Course coordinator: o. Prof. Dr.-Ing. Hendrik Lensch, B.Sc. Raphael Braun, M.Sc. Jieen Chen
Additional information
https://ovidius.uni-tuebingen.de/ilias3/goto.php?target=crs_1418470&client_id=pr02

Course title: Drug Design 2 (Ligand-based Drug Design) (Course number: BIOINF4372)
Link: http://campus.uni-tuebingen.de/20171e150723
Course type: Lecture/Excercises
Contact hours: 2
Course coordinator: o. Prof. Dr.-Ing. Oliver Kohlbacher, Mitarbeiter, Dr. rer. nat. Philipp Thiel
Target audience
3. Studienjahr (BSc), 1. Studienjahr (MSc)

Course title: Flying Robots (Course number: INF4364)
Link: http://campus.uni-tuebingen.de/20171e150773
Course type: Internship
Contact hours: 4
Course title: Fortgeschrittene Themen aus Computer Graphik und Computer Vision  (Course number: INF4168)
Link: http://campus.uni-tuebingen.de/20171e150758
Course type: Seminar
Contact hours: 
Course coordinator: M.Sc. Sebastian Herholz, Dipl.-Inform. Katharina Schwarz

Course title: Gaze-based Interactive Systems
Link: http://campus.uni-tuebingen.de/20171e153684
Course type: Seminar
Contact hours: 
Course description
Dozent: Shahram Eivazi (Teach@Tübingen) Details of the seminar see 

Additional information

Course title: Intelligent Systems - Machine Learning for Robotics  (Course number: INFO4177)
Link: http://campus.uni-tuebingen.de/20171e150812
Course type: Lecture/Excercises
Contact hours: 
Target audience
Master students in Computer Science, Mathematics and Physics and associated fields.
Course description

Course title: Kryptologie  (Course number: INFO4451)
Link: http://campus.uni-tuebingen.de/20171e152344
Course type: Lecture/Excercises
Contact hours: 
Addional information
http://www-ti.informatik.uni-tuebingen.de/~borchert/krypto2017/

Course title: Machine Learning: Algorithms and Theory  (Course number: INFO4491)
Link: http://campus.uni-tuebingen.de/20171e150810
Course type: Lecture/Excercises
Contact hours: 
Course coordinator: Prof. Dr. rer. nat. Ulrike Luxburg
Course description
In many applications and domains, massive amounts of data are collected and processed every day. To be able to make efficient use of such data, there is an urgent need for tools to extract important pieces of information from the flood of unimportant details. Machine learning is a relatively young discipline that tries to deal with this problem, by designing algorithms to analyze large amounts of complex data in a principled way. Machine learning is the core technique in many applications such as spam filtering, object recognition, analyzing user preferences, recommender systems, and so on. Scientific disciplines such as biology, neuroscience, physics, or medicine discover the potential of machine learning methods for analyzing their empirical data. And, last but not least, many large companies like google, Amazon, facebook heavily rely on machine learning techniques. The field of machine learning combines ingredients from several fields: we need to design efficient algorithms to process the amount of data, and we need to
ensure that predictions made by machine learning algorithms are statistically sound. The focus of
the lecture is on algorithmic and theoretical aspects of machine learning. We will cover many of
the standard algorithms, learn about the general principles for building good machine learning
algorithms, and analyze their theoretical properties. - Supervised learning problems: Linear
methods; regularization; SVMs; kernel methods - Unsupervised learning
problems: Dimension reduction (kernel PCA, multi-dimensional scaling, manifold methods);
spectral clustering and spectral graph theory - How to model machine learning problems:
Bayesian decision theory, loss functions, feature selection, evaluation and comparison of
algorithms. Common pitfalls - Online algorithms - Learning theory (no free lunch theorem;
generalization bounds; VC dimension; universal consistency; Theorem of Stone) - Low rank
matrix methods (collaborative filtering, low rank matrix completion, compressed sensing) The
following topics are NOT going to be covered: decision trees, neural networks / deep networks,
graphical models, Bayesian approaches to machine learning, reinforcement learning.

Additional information
http://www.tmi.cs.uni-tuebingen.de/teaching/index.php

Course title: Machine Learning and Artificial Neural Networks in Biomedical Applications (Course number: INFO4192)
Link: http://campus.uni-tuebingen.de/20171e150765
Course type: Seminar
Contact hours:
Course coordinator: Dr. rer. nat. Martin Spüler
Course description
The Seminar “Machine Learning and Artificial Neural Networks in Biomedical Applications” covers
current topics of signal processing on neural signals (e.g. fMRI, EEG or MEG) for their use in
biomedical applications (e.g. neuroprosthetics or brain-computer interfaces, BCIs) and related
topics; as well as methods and algorithms applied in those fields.

Course title: Machine Learning II (Course number: NIP02B)
Link: http://campus.uni-tuebingen.de/20171e150856
Course type: Lecture/Excercises
Contact hours: 4
Course coordinator: Prof. Dr.-Ing. Martin Giese
Prerequisites
Machine learning I
Course description
After the course, the participants will have a solid understanding of probability logic, Bayesian
networks, inference and learning in Bayesian networks and Markov random fields with exact,
(variational) EM and sampling methods. Moreover, the course covers modern stochastic process
approaches in Machine learning, such as the Gaussian process and dynamical extensions.
Additional information
http://www.neuroschool-tuebingen.de/courses/summer-term/master-neural-inf-process/?tx_neuros
cence_pi1[course]=11&tx_neuroscience_pi1[action]=show&tx_neuroscience_pi1[controller]=
Course&cHash=d034a785b55f3873c9b9533f32b3c764

Course title: Massively Parallel Computing (Course number: INFO4173)
Link: http://campus.uni-tuebingen.de/20171e150759
Course type: Lecture/Excercises
Contact hours: 4
Course coordinator: o. Prof. Dr.-Ing. Hendrik Lensch, Dipl.-Inf. Benjamin Resch, M.Sc. Patrick
Wieschollek
Course description
Blockveranstaltung vor Vorlesungsbeginn Vorlesung mit Übungen

Additional information
https://ovidius.uni-tuebingen.de/ilias3/goto.php?target=crs_1401534&client_id=pr02

Course title: Psychophysical Methods
Link: http://campus.uni-tuebingen.de/20171e151708
Course type: Lecture
Contact hours:
Course coordinator: o. Prof. D.Phil. Felix Wichmann
Additional information
http://www.nip.uni-tuebingen.de/teaching/lectures-seminars

Course title: Spatial Vision
Link: http://campus.uni-tuebingen.de/20171e151709
Course type: Seminar
Contact hours:
Course coordinator: o. Prof. D.Phil. Felix Wichmann
Additional information
http://www.nip.uni-tuebingen.de/teaching/lectures-seminars

Course title: Spezielle Themen der Algorithmik (Course number: INFO4419)
Link: http://campus.uni-tuebingen.de/20171e150769
Course type: Lecture/Excercises
Contact hours:
Course coordinator: Ph.D. Patrizio Angelini, o. Prof. Dr. rer. nat. Michael Kaufmann
Course description
Inhalt: Perlen der Algorithmik

Course title: Structure and Systems Bioinformatics (Course number: BIOINF4120)
Link: http://campus.uni-tuebingen.de/20171e150725
Course type: Lecture/Excercises
Contact hours:
Course coordinator: Mitarbeiter, o. Prof. Dr.-Ing. Oliver Kohlbacher
Target audience
1. Studienjahr

Course title: Visualisation of Biological Data (Course number: BIO4364)
Link: http://campus.uni-tuebingen.de/20171e150734
Course type: Lecture
Contact hours:
Course coordinator: Jun.-Prof. Dr. rer. nat. Julian Heinrich
Course description
As biological datasets increase in size and complexity, we are moving more and more from an hypothesis-driven research paradigm to a data-driven one. As a result, exploration of that data has become even more crucial than in the past. The aim of this lecture is to familiarise the participants with modern visual analytics methodologies applied to biological data and to provide hands-on training during the tutorials. Questions such as what is data visualization, what is visual analytics and how can we visualise biological data to gain insight in them, so that hypotheses can be generated or explored and further targeted analyses can be defined.
Information and Media Technologies – Bachelor

Course title: Computational Photography  (Course number: INFO4176)
Link: http://campus.uni-tuebingen.de/20171e150760
Course type: Lecture/Excercises
Contact hours: 4
Course coordinator: o. Prof. Dr.-Ing. Hendrik Lensch, B.Sc. Raphael Braun, M.Sc. Jieen Chen
Additional information
https://ovidius.uni-tuebingen.de/ilias3/goto.php?target=crs_1418470&client_id=pr02

Course title: Drug Design 2 (Ligand-based Drug Design)  (Course number: BIOINF4372)
Link: http://campus.uni-tuebingen.de/20171e150723
Course type: Lecture/Excercises
Contact hours: 2
Course coordinator: o. Prof. Dr.-Ing. Oliver Kohlbacher, Mitarbeiter, Dr. rer. nat. Philipp Thiel
Target audience
3. Studienjahr (BSc), 1. Studienjahr (MSc)

Course title: Systems Biology I - Properties of Reconstructed Networks  (Course number: BIOINF3371)
Link: http://campus.uni-tuebingen.de/20171e151763
Course type: Lecture/Excercises
Contact hours:
Course coordinator: Jun.-Prof. Dr. rer. nat. Andreas Dräger
Prerequisites
The prerequisite is some knowledge of linear algebra and biochemistry. Through the links between mathematical ideas and biological processes are made clear, the lecture reflects the irreversible trend of increasing mathematical content in biology education. Grundlegende Kenntnisse linearer Algebra und der Biochemie.

Course description
Genome sequences are now available that enable us to determine the biological components that make up a cell or an organism. Systems biology examines how these components interact and form networks and how the networks generate whole cell functions corresponding to observable phenotypes. This lecture is an introduction to basic concepts of systems biology devoted to undergraduate students. It describes how to model networks, how to determine their properties, and how to relate these to phenotypic functions.

Mathematics – Bachelor

Course title: Machine Learning: Algorithms and Theory  (Course number: INFO4491)
Link: http://campus.uni-tuebingen.de/20171e150810
Course type: Lecture/Excercises
Contact hours:
Course coordinator: Prof. Dr. rer. nat. Ulrike Luxburg
Course description
In many applications and domains, massive amounts of data are collected and processed every day. To be able to make efficient use of such data, there is an urgent need for tools to extract important pieces of information from the flood of unimportant details. Machine learning is a relatively young discipline that tries to deal with this problem, by designing algorithms to analyze large amounts of complex data in a principled way. Machine learning is the core technique in
many applications such as spam filtering, object recognition, analyzing user preferences, recommender systems, and so on. Scientific disciplines such as biology, neuroscience, physics, or medicine discover the potential of machine learning methods for analyzing their empirical data. And, last but not least, many large companies like google, Amazon, facebook heavily rely on machine learning techniques. The field of machine learning combines ingredients from several fields: we need to design efficient algorithms to process the amount of data, and we need to ensure that predictions made by machine learning algorithms are statistically sound. The focus of the lecture is on algorithmic and theoretical aspects of machine learning. We will cover many of the standard algorithms, learn about the general principles for building good machine learning algorithms, and analyze their theoretical properties. - Supervised learning problems: Linear methods; regularization; SVMS; kernel methods - Unsupervised learning problems: Dimension reduction (kernel PCA, multi-dimensional scaling, manifold methods); spectral clustering and spectral graph theory - How to model machine learning problems: Bayesian decision theory, loss functions, feature selection, evaluation and comparison of algorithms. Common pitfalls - Online algorithms - Learning theory (no free lunch theorem; generalization bounds; VC dimension; universal consistency; Theorem of Stone) - Low rank matrix methods (collaborative filtering, low rank matrix completion, compressed sensing) The following topics are NOT going to be covered: decision trees, neural networks / deep networks, graphical models, Bayesian approaches to machine learning, reinforcement learning.

Additional information
http://www.tml.cs.uni-tuebingen.de/teaching/index.php

Mathematics – Master

Course title: Machine Learning: Algorithms and Theory  (Course number: INFO4491)
Link: http://campus.uni-tuebingen.de/20171e150810
Course type: Lecture/Excercises
Contact hours:
Course coordinator: Prof. Dr. rer. nat. Ulrike Luxburg
Course description
In many applications and domains, massive amounts of data are collected and processed every day. To be able to make efficient use of such data, there is an urgent need for tools to extract important pieces of information from the flood of unimportant details. Machine learning is a relatively young discipline that tries to deal with this problem, by designing algorithms to analyze large amounts of complex data in a principled way. Machine learning is the core technique in many applications such as spam filtering, object recognition, analyzing user preferences, recommender systems, and so on. Scientific disciplines such as biology, neuroscience, physics, or medicine discover the potential of machine learning methods for analyzing their empirical data. And, last but not least, many large companies like google, Amazon, facebook heavily rely on machine learning techniques. The field of machine learning combines ingredients from several fields: we need to design efficient algorithms to process the amount of data, and we need to ensure that predictions made by machine learning algorithms are statistically sound. The focus of the lecture is on algorithmic and theoretical aspects of machine learning. We will cover many of the standard algorithms, learn about the general principles for building good machine learning algorithms, and analyze their theoretical properties. - Supervised learning problems: Linear methods; regularization; SVMS; kernel methods - Unsupervised learning problems: Dimension reduction (kernel PCA, multi-dimensional scaling, manifold methods); spectral clustering and spectral graph theory - How to model machine learning problems: Bayesian decision theory, loss functions, feature selection, evaluation and comparison of algorithms. Common pitfalls - Online algorithms - Learning theory (no free lunch theorem; generalization bounds; VC dimension; universal consistency; Theorem of Stone) - Low rank
matrix methods (collaborative filtering, low rank matrix completion, compressed sensing) The following topics are NOT going to be covered: decision trees, neural networks / deep networks, graphical models, Bayesian approaches to machine learning, reinforcement learning.

**Additional information**
http://www.tml.cs.uni-tuebingen.de/teaching/index.php

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**Nanoscience – Bachelor**

**Course title:** Bioinformatics for Life Scientists  (Course number: BIOINF1910)
**Link:** http://campus.uni-tuebingen.de/20171e150726
**Course type:** Lecture/Excercises
**Contact hours:** 3
**Course coordinator:** o. Prof. Dr.-Ing. Oliver Kohlbacher

**Target audience**
2. Studienjahr

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**Course title:** Einführung in die Nano-Science I
**Link:** http://campus.uni-tuebingen.de/20171e148602
**Course type:** Lecture
**Contact hours:** 4
**Course coordinator:** Dr. rer. nat. Üner Kolukisaoglu, Prof. Dr. rer. nat. Reiner Anwander, Jun.-Prof. Dr. rer. nat. Monika Fleischer, o. Prof. Dr. rer. nat. Klaus Harter, Dr. rer. nat. Yucang Liang, Prof. Dr. rer. nat. Erik Schäffer, Prof. Dr. rer. nat. Frank Schreiber, PD Dr. rer.nat. Fajun Zhang

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**Course title:** S-Schiene (Fr) “A journey through the RNA world: from ribozymes to riboswitches” (4021)
**Link:** http://campus.uni-tuebingen.de/20171e151798
**Course type:** Block Course
**Contact hours:**
**Course coordinator:** Dr. rer. nat. Andreas Wachter
**Target audience**
Themenmodul im Master (2. Semester)
**Prerequisites**
Teilnahme an den Grundmodulen “Biomoleküle der Zelle” (BMZ), “Molekulare Biologie I und II” (MBI, MBII) oder vergleichbaren Veranstaltungen
**Course description**
This module aims at providing an overview of the functional capacity of RNA elements in viruses, bacteria and eukaryotes. Besides catalytically active RNAs, mainly aspects of RNA-based gene regulatory mechanisms will be discussed. In the wide field of RNA-mediated gene control, topics will be primarily focused on structured mRNA elements including thermosensors and riboswitches. The lecture section will provide an introduction into the various aspects of RNA functions in different cellular processes. In the tutorial and the seminar, selected aspects will be discussed in more detail and general principles will be worked out. The lectures will be given in English, whereas discussions and presentations can be held in German as well. A final written examination will take place on July 21st, 2017 at 10 c.t. at ZMBP, in room6R01 (Besprecher 2).

**Course title:** S-Schiene (Mo) Molecular Cell Biology (4024)
**Link:** http://campus.uni-tuebingen.de/20171e146650
**Course type:** Lecture
Contact hours: 2
Course coordinator: Dr. rer. nat. Christopher Grefen, Dr. rer. nat. Sabine Müller, Dr. rer. nat. Peter Pimpl, Dr. rer. nat. Laura Ragni, o. Prof. Dr. rer. nat. Gerd Jürgens

Target audience

Course description
Überblick über den Stand der Forschung und aktuelle Forschungsthemen in der molekularen Zellbiologie.

Nanoscience – Master

Course title: Comparative innate immunity in animals and plants, Themenmodul 4026
Link: http://campus.uni-tuebingen.de/20171e146683
Course type: Lecture/Excercises
Contact hours: 3
Course coordinator: o. Prof. Dr. rer. nat. Thorsten Nürnberg, Prof. Dr. rer. nat. Georg Felix, PD Dr. rer. nat. Andrea Gust, Dr. rer. nat. Birgit Kemmerling
Target audience
M.Sc. in Biochemistry or Biology
Prerequisites
Lecture in the preceding winter semester.

Course description
Module comprises a lecture, seminar and tutorial. The lecture (winter semester) concerns current topics of innate immunity in animals and plants. The seminar (summer semester) consolidates the topics covered in the lecture by using original publications. Content of the tutorial (summer semester) will be writing of a research proposal based on the original publications covered in the seminar. The seminar and tutorial will take place in the summer semester. Final schedule for the seminar and the discussion of proposals within the tutorial will be according to agreement.

Course title: Elective: Advanced-Level Course in Plant Physiology 4031
Link: http://campus.uni-tuebingen.de/20171e150487
Course type: Block Course
Contact hours: 13
Course coordinator: o. Prof. Dr. rer. nat. Klaus Harter, Dr. rer. nat. Christina Chaban, Dr. rer. nat. Nina Jaspert, Dr. rer. nat. Sascha Laubinger, Prof. Dr. rer. nat. Claudia Oecking, Dr. rer. nat. Virtudes Mira-Rodado, Dr. rer. nat. Markus Albert, Dr. rer. nat. Gabriel Schaaf
Prerequisites
A background in molecular plant science is expected
Course description
Implementation of a small research project involving a wide spectrum of methods

Course title: Pflichtthemenmodul: Current Topics in General Genetics (4014)
Link: http://campus.uni-tuebingen.de/20171e151795
Course type: Lecture/Excercises
Contact hours:
Course coordinator: Dr. rer. nat. Andreas Wachter, apl. Prof. Dr. rer. nat. Ulrike Zentgraf, o. Prof. Dr. rer. nat. Thomas Lahaye
Target audience
Masterstudierende im 1.-3. Fachsemester

Course description

Course title: Physik der Nanostrukturen (Course number: BMEPPN)
Link: [http://campus.uni-tuebingen.de/20171e149575](http://campus.uni-tuebingen.de/20171e149575)
Course type: Lecture
Contact hours: 4
Course coordinator: Jun.-Prof. Dr. rer. nat. Monika Fleischer, Prof. Dr. rer. nat. Dieter Kölle, Prof. Dr. rer. nat. Frank Schreiber
Prerequisites
Empfohlen: Basismodul Kondensierte Materie

Course description
Einführung: Festkörperphysik in reduzierten Dimensionen; Herstellungsverfahren und Charakterisierungsmethoden; Halbleiter-Grenzflächen und Bauelemente; Halbleiter-Nanostrukturen; Grenzflächen in metallischen Systemen und Bauelemente (magnetische und supraleitende); metallische, supraleitende und magnetische Nanostrukturen; Grenzflächen zwischen Isolatoren; organische Systeme und biologische Materialien; Kohlenstoff-basierte Systeme (Carbon Nanotubes und Graphen); elektronische, magnetische, mechanische und optische Eigenschaften von Nanostrukturen; Nanostrukturen und Metrologie

Course title: Single Molecule Biophysics (practical course)
Link: [http://campus.uni-tuebingen.de/20171e150599](http://campus.uni-tuebingen.de/20171e150599)
Course type: Practical Course
Contact hours: 2
Course coordinator: M.Sc. Michael Bugiel, M.Sc. Tobias Jachowski, Prof. Dr. rer. nat. Erik Schäffer, Dr. rer. nat. Anita Jannasch

Course title: Single Molecule Biophysics (seminar)
Link: [http://campus.uni-tuebingen.de/20171e150600](http://campus.uni-tuebingen.de/20171e150600)
Course type: Seminar
Contact hours: 2
Course coordinator: M.Sc. Michael Bugiel, M.Sc. Tobias Jachowski, Prof. Dr. rer. nat. Erik Schäffer, Dr. rer. nat. Anita Jannasch

Course title: TCM2 (Computational Chemistry) Lecture (Course number: PC0830)
Link: [http://campus.uni-tuebingen.de/20171e146538](http://campus.uni-tuebingen.de/20171e146538)
Course type: Lecture
Contact hours: 2
Course coordinator: Prof. Dr. rer. nat. Reinhold Fink

Course title: TCM2U Computational Chemistry Exercises (Course number: PC0834)
Link: [http://campus.uni-tuebingen.de/20171e146563](http://campus.uni-tuebingen.de/20171e146563)
Course type: Exercises
Contact hours: 1
Course coordinator: Prof. Dr. rer. nat. Reinhold Fink
Cognition Science – Bachelor

Course title: An Introduction to the Mind and Brain for Linguists  
Link: http://campus.uni-tuebingen.de/20171e153569  
Course type: Hauptseminar  
Contact hours: 2  
Course coordinator: Ph.D. Michael Ramscar  
Course description: This course provides an introduction to cognitive psychology and neuroscience with an emphasis on topics relevant to the study of language. The course consists of a series of lectures in which central topics are introduced, together with a classic paper on the topic that students are asked to read in preparation for the class. The course starts off with an overview of the architecture of the human brain, describing the main functional areas, and the questions that arise out of our attempts to characterize function. We then step back to consider the unique developmental pattern associated with the human brain, and then consider what we know about the cognitive functions that arise out of human neural processing, considering topics such as: learning and memory, choice and response selection, reasoning, cognitive development, lifespan cognition and the neural changes associated with aging. For assessment purposes, students will be required to write a series short (one-page) reviews, covering a subset of the topics (a question will be assigned for each topic). At the end of this course, participants will have acquired the background knowledge to enable them to consider linguistic questions in terms of the processing capabilities of the mind/brain.

Course title: Bayesian Data Analysis and Cognitive Modeling  
Link: http://campus.uni-tuebingen.de/20171e151159  
Course type: Hauptseminar  
Contact hours: 2  
Course coordinator: Dr. phil. Michael Franke  
Course description: The course introduces ideas and methods of a Bayesian approach to data analysis, as opposed to a “classical” frequentist approach. We will review the main differences between these paradigms, but focus on practical methods to get a Bayesian approach off the ground. The course will introduce Markov chain Monte Carlo methods, in particular the use of JAGS and Stan. We look at model comparison and briefly at regression modeling from a Bayesian point of view. We will also discuss the versatility of the Bayesian approach to test hierarchical models of arbitrary make-up. But for the most part, the course is oriented towards practical applications: we will discuss examples from cognitive modeling, with a special emphasis on psycholinguistics. Prior knowledge of statistical analysis is advantageous but not strictly required. Basic computer programming skills are highly recommended. (The textbooks we look at will use R, but you can use anything you like (as long as it does the job for you)).

Course title: Consciousness, behavior & EEG  
Link: http://campus.uni-tuebingen.de/20171e152510  
Course type: Internship  
Contact hours: 6  
Course coordinator: Prof. Dr. rer. nat. Volker Franz  
Course description: This course consists of three parts: (a) We will learn typical neuroscientific approaches to the study of consciousness (answering questions like: What is the function of consciousness? Which tasks could be performed without conscious awareness?) (b) We will learn typical behavioral and EEG paradigms to investigate these questions and perform a simple behavioral and EEG experiment in our lab (c) We will analyze the behavioral data using R and show you how the EEG
data could be analysed. In the end you will write a short scientific report, summarizing our experimental results and following the classic APA-style. This will give you practice for future scientific projects (e.g., BSc/MSc thesis). Please note that during the first sessions (part a, see above) there is a little overlap with my group in the Kogwiss-B Praktikum of WS 2016/17, such that I advice students who do not like that to not choose both courses in succession. LITERATUR: Dehaene, S., Naccache, L., Le Clec'H, G., Koechlin, E., Mueller, M., Dehaene-Lambertz, G., van de Moortele, P. F., & Le Bihan, D. (1998). Imaging unconscious semantic priming. Nature, 395, 597-600. Wickham, H. (2014). Advanced R. Chapman & Hall/CRC Press: New York. We will only look at chapter 10 of this book (which gives a beautiful introduction to functional programming in R). The book is online available at: http://adv-r.had.co.nz/ Further literature will be made available during the course.

**Course title:** Deep Learning for Natural Language Processing  
**Link:** http://campus.uni-tuebingen.de/20171e150075  
**Course type:** Hauptseminar  
**Contact hours:** 4  
**Course coordinator:** Dr. phil. Daniël de Kok  
**Prerequisites**  
Entrance requirements for ISCL BA major students: Introduction to Computational Linguistics Logic Statistics Java 1 + 2 Programming Course Computational Linguistics Parsing  
It is also strongly recommended to have completed Statistical Language Processing.  
Entrance requirements for ISCL minor students: Introduction to Computational Linguistics Logic Java 1 + 2 Parsing  
Entrance requirements for ISCL major students: Background in computational linguistics (e.g. you should now part-of-speech taggers, parsers, etc. work). Programming background equivalent to Java 1 + 2. Some background in statistics/probability theory.  
**Course description**  
In the past two decades, statistical approaches have become dominant in the field of natural language processing, where most work has relied on linear classifiers, such as perceptrons, log-linear models, and support vector machines with a linear kernel. However, due to recent theoretical and technical advances, the field has recently rekindled its interest in deep learning. Deep learning consists of a set of algorithms and techniques that attempt to infer complex features of data. This typically reduces the amount of feature engineering that is necessary and finds interactions that would be difficult to find for humans. Consequently, deep learning techniques improved the state-of-the-art in many natural language processing tasks considerably. This hauptseminar consists of two parts. The first part provides an introduction to deep learning-related techniques that are relevant to natural language processing, such as feed-forward neural networks, recurrent neural networks, recursive neural networks, word embeddings, and auto-encoders. In the second part, we will read and discuss papers that use deep learning for typical natural language processing tasks, such as morphological analysis, part-of-speech tagging, parsing, and sentiment analysis. Throughout the course, we will implement many of the deep learning techniques using Google’s Tensorflow library.

**Course title:** Discriminative Linguistics  
**Link:** http://campus.uni-tuebingen.de/20171e153570  
**Course type:** Hauptseminar  
**Contact hours:** 2  
**Course coordinator:** Ph.D. Michael Ramscar  
**Course description**  
This seminar takes an in depth look at recent approaches to characterizing human communication in terms of the discriminative properties of human learning. Whereas traditionally, linguists have considered meaning in compositional terms, discriminative linguistics treats communication as a process in which signals serve to reduce semantic uncertainty. The seminar
will consider in depth what this means, relating the approach to human learning processes, as well as to Shannon’s Theory of Information, in which communication is also treated as a deductive process aimed at uncertainty reduction. As well as considering the theory and background of discriminative linguistics, the course will look at the application of discriminative models across a range of topics including language learning, morphology, speech, reading and the way that discriminative models can be used to shed light on lexical distributions. For assessment purposes, students are required to write an extended term paper on one of the topics discussed in the course. At the end of this course, participants will have an understanding of current literature on discriminative linguistics.

**Course title:** Grammar Formalisms in Computational Linguistics  
**Link:** http://campus.uni-tuebingen.de/20171e149842  
**Course type:** Proseminar  
**Contact hours:** 4  
**Course coordinator:** Dr. phil. Kurt Eberle  
**Course description**  
Given that natural languages cannot be characterized by simply listing all possible sentences and their meaning, a range of grammar formalisms have been developed to characterize form and meaning in a general and compact way. The approaches differ in terms of their focus, empirical coverage, formal foundations, expressive power, conceptualization of generalizations, and the processing regimes that have been developed for those formalisms. After a general overview of grammar types in the Chomsky Hierarchy, we will discuss plain context-free grammars as a baseline on which we will introduce and compare several current grammar formalisms. The plan is to include a discussion of unification-based phrase structure grammars and dependency grammars like Head-Driven Phrase Structure Grammar (HPSG), Lexical Functional Grammar (LFG), Slot Grammar, but, if time allows, also others like Categorial Grammar. The focus will be on obtaining a sound working knowledge of how different formalisms capture some of the fundamental phenomena of natural language syntax: argument and adjunct realization, agreement and government, middle-distance phenomena (e.g., equi, raising), long-distance phenomena (e.g., fronting).

**Course title:** Introduction to the Philosophy of Action (BA 01, 03)  
**Link:** http://campus.uni-tuebingen.de/20171e148806  
**Course type:** Lecture  
**Contact hours:** 2  
**Course coordinator:** Dr. Hong Yu Wong  
**Course description**  
For details of all courses students should consult: https://sites.google.com/site/whywong/teaching

**Course title:** Philosophy of Action (BA 01, 03, 05)  
**Link:** http://campus.uni-tuebingen.de/20171e148807  
**Course type:** Proseminar  
**Contact hours:** 2  
**Course coordinator:** Dr. Hong Yu Wong  
**Course description**  
For details of all courses students should consult: https://sites.google.com/site/whywong/teaching

**Course title:** Philosophy of Mind and Cognitive Science (Oberseminar)  
**Link:** http://campus.uni-tuebingen.de/20171e148809  
**Course type:** Oberseminar  
**Contact hours:** 3  
**Course coordinator:** Dr. Hong Yu Wong
Course description
For details of all courses students should consult: https://sites.google.com/site/whywong/teaching

Course title: Phonetics and Phonology
Link: http://campus.uni-tuebingen.de/20171e149844
Course type: Proseminar
Contact hours:
Course coordinator: Fabian Tomaschek
Prerequisites
IMPORTANT: The course will present speech signal examples by means of Praat (http://www.fon.hum.uva.nl/praat/). In order to make the course as productive as possible, students need to own and bring their OWN LAPTOP COMPUTER to the course so that usage of the program, i.e. acoustical analysis and measurements can be done by the students on their own.

Course description
Phonetics +++++++++ The course will present the biological, physical and acoustic basics, which are necessary to understand current problems and research questions in Phonetics. Biological basics cover the articulatory and respiratory apparatus; physical and acoustic basics cover the study the spectro-temporal characteristics of the speech signal. Phonology +++++++++ Simultaneously, the course will give a thorough introduction into current, to certain extent contradictory, formal theories of Phonology. Their relation to the phonetic and physical reality as well as their problematics will be discussed.

Course title: Reduction in spontaneous speech
Link: http://campus.uni-tuebingen.de/20171e151068
Course type: Proseminar
Contact hours: 2
Course coordinator: Ph.D. June Hendrix-Sun
Course description
When people are speaking, not all words are fully pronounced. Many acoustic forms are subject to reduction. The sentence “I don’t know”, for instance, is often reduced to “I dunno”, or even “I ono”. Recently, the phenomenon of acoustic reduction has enjoyed increased popularity in phonetic research in different languages. In this course, we will review this research to get an idea about the circumstances in which acoustic reduction occurs. Furthermore, you will gain hands-on experience by looking at acoustic reduction in actual speech data in Mandarin Chinese.

Course title: Regression Modeling Strategies for the Analysis of Linguistic and Psycholinguistic Data
Link: http://campus.uni-tuebingen.de/20171e153506
Course type: Hauptseminar
Contact hours: 3
Course coordinator: Prof. Dr. phil. Harald Baayen
Course description
This course provides practical training in the use of modern regression techniques for understanding linguistic and psycholinguistic data. In the first part of the course, the standard linear model is introduced, with special attention to model diagnostics, methods for dealing with collinearity, th dummy coding of factors, and the use of link functions. The second part of the course introduces the linear mixed-effects model, which is essential for modeling data sets with repeated observations for predictors such as participants in experiments, and linguistic units such as words, sentences, or texts. The focus in this part of the course will be on the interpretation of the parameters for these so-called random-effect factors. The third part of the course moves on to generalized additive models, a relatively recent development in regression modeling that makes
it possible to capture nonlinear relations between predictors and the response variable, including wiggly curves and wiggly (hyper)surfaces. Each class consists of a lecture introducing basic concepts and methods, followed by a hands-on lab session in which participants receive training in using the R statistical programming environment. Data sets discussed in the lab sessions range from dialectometry to eye-movements and from reaction time data to evoked response potentials. By the end of this course, participants will be able to apply state-of-the-art methods in regression to their own datasets, as well as critically evaluate analyses reported in the literature.

**Course title:** S Bayesian estimation and model selection  
**Link:** http://campus.uni-tuebingen.de/20171e152500  
**Course type:** Seminar  
**Contact hours:** 2  
**Course coordinator:** PD Dr. phil. Martin Lages  
**Course description**  
Modern statistical tools enable us to build and test tailored models of cognitive processing. In this seminar and tutorial we will model discrete and continuous observed data using examples from a range of topics. We will discuss different sampling approaches and work through a number of exercises using packages in R/RStudio. Some programming knowledge and exposure to R would be beneficial but is not essential. PBYOL (please bring your own laptop). Im Kurs sind drei Plätze für Studierende der Kognitionswissenschaft (B.Sc.) zu vergeben. Diese können sich für diese Veranstaltung per E-Mail über das Studienbüro (studienberatung@psycho.uni-tuebingen.de) anmelden.

**Course title:** Statistical Language Processing (CL III)  
**Link:** http://campus.uni-tuebingen.de/20171e149848  
**Course type:** Proseminar  
**Contact hours:** 6  
**Course coordinator:** Dr. phil. Cagri Çöltekin  
**Course description**  
First, the course introduces some basic statistics including descriptive statistics, hypothesis testing, elementary probability and information theories, as well as an introduction to regression and classification. Second, based on that theoretical background the course covers basic techniques in statistical natural language processing, such as Markov chains, hidden Markov models, PCFGs as well as applications such as language modelling, part-of-speech tagging, word sense disambiguation and text categorization.

**Course title:** The Body and the Self  
**Link:** http://campus.uni-tuebingen.de/20171e148808  
**Course type:** Hauptseminar  
**Contact hours:** 2  
**Course coordinator:** Dr. Hong Yu Wong  
**Course description**  
Hauptseminar: The Body and the Self - Block seminar on Frederique de Vignemont’s Mind the Body (Oxford University Press, 2017) For details of all courses students should consult: https://sites.google.com/site/whywong/teaching

**Course title:** The structure of Proto Indo-European  
**Link:** http://campus.uni-tuebingen.de/20171e151171  
**Course type:** Proseminar  
**Contact hours:** 2  
**Course coordinator:** MA Fabrício Marcel Ferraz Gerardi  
**Course description**
The Structure of Proto-indo-european   Using theoretical linguistics and comparative reconstruction, we will depart from modern and ancient IE languages towards a reconstruction of PIE (phonology, morphology and syntax). Language change (language evolution) will be studied and presented aided by the vocabulary of modern biology, following a tendency within recent (historical) linguistics. Simple computational methods of reconstruction and comparison will also be presented (no previous knowledge required). At the end of the course, students will have a general view of: (1) the structure of PIE and of its descendants, (2) an overview of the methods used in historical linguistics, (3) language evolution.

Strukturkurs  Proto-Indoeuropäisch   In Anwendung theoretischer Linguistik und vergleichender Rekonstruktion wird von modernen und antiken indoeuropäischen Sprachen zum rekonstruierten PIE (Phonologie, Morphologie und Syntax) ausgegangen. Der Sprachwandel (Sprachevolution) wird untersucht und mithilfe des Wortschatzes der modernen Biologie dargestellt, was eine Tendenz innerhalb der (historischen) Linguistik ist. Einfache computationele Methoden für den Vergleich und die Rekonstruktion wird ebenfalls dargestellt (Vorkenntnisse nicht erforderlich). Am Ende des Kurses werden Studierende eine allgemeine Übersicht folgender Aspekte haben: (1) die Struktur des PIE und dessen Nachkommen, (2) die angewandten Methoden der historischen Linguistik, (3) Sprachevolution.

Course title: Visual Information Processing in Perception and Action
Link: http://campus.uni-tuebingen.de/20171e151894
Course type: Colloquium
Contact hours:
Course coordinator: Prof. Dr. rer. nat. Volker Franz

Cognition Science – Master

Course title: Advanced Statistics
Link: http://campus.uni-tuebingen.de/20171e151893
Course type: Lecture
Contact hours: 2
Course coordinator: Prof. Dr. rer. nat. Volker Franz, Prof. Dr. rer. biol. hum. Steffen Gais
Course description
Please see the detailed course-description at: http://www.ecogsci.cs.uni-tuebingen.de/teach.php
Additional information
http://www.ecogsci.cs.uni-tuebingen.de/teach.php

Course title: An Introduction to the Mind and Brain for Linguists
Link: http://campus.uni-tuebingen.de/20171e153569
Course type: Hauptseminar
Contact hours: 2
Course coordinator: Ph.D. Michael Ramscar
Course description
This course provides an introduction to cognitive psychology and neuroscience with an emphasis on topics relevant to the study of language. The course consists of a series of lectures in which central topics are introduced, together with a classic paper on the topic that students are asked to read in preparation for the class. The course starts off with an overview of the architecture of the human brain, describing the main functional areas, and the questions that arise out of our attempts to characterize function. We then step back to consider the unique developmental pattern associated with the human brain, and then consider what we know about the cognitive
functions that arise out of human neural processing, considering topics such as: learning and memory, choice and response selection, reasoning, cognitive development, lifespan cognition and the neural changes associated with aging. For assessment purposes, students will be required to write a series short (one-page) reviews, covering a subset of the topics (a question will be assigned for each topic). At the end of this course, participants will have acquired the background knowledge to enable them to consider linguistic questions in terms of the processing capabilities of the mind/brain.

Course title: Deep Learning for Natural Language Processing
Link: http://campus.uni-tuebingen.de/20171e150075
Course type: Hauptseminar
Contact hours: 4
Course coordinator: Dr. phil. Daniël de Kok
Prerequisites
Entrance requirements for ISCL BA major students: Introduction to Computational Linguistics Logic Statistics Java 1 + 2 Programming Course Computational Linguistics Parsing It is also strongly recommended to have completed Statistical Language Processing. Entrance requirements for ISCL minor students: Introduction to Computational Linguistics Logic Java 1 + 2 Parsing Entrance requirements for ISCL major students: Background in computational linguistics (e.g. you should now part-of-speech taggers, parsers, etc. work). Programming background equivalent to Java 1 + 2. Some background in statistics/probability theory.
Course description
In the past two decades, statistical approaches have become dominant in the field of natural language processing, where most work has relied on linear classifiers, such as perceptrons, log-linear models, and support vector machines with a linear kernel. However, due to recent theoretical and technical advances, the field has recently rekindled its interest in deep learning. Deep learning consists of a set of algorithms and techniques that attempt to infer complex features of data. This typically reduces the amount of feature engineering that is necessary and finds interactions that would be difficult to find for humans. Consequently, deep learning techniques improved the state-of-the-art in many natural language processing tasks considerably. This hauptseminar consists of two parts. The first part provides an introduction to deep learning-related techniques that are relevant to natural language processing, such as feed-forward neural networks, recurrent neural networks, recursive neural networks, word embeddings, and auto-encoders. In the second part, we will read and discuss papers that use deep learning for typical natural language processing tasks, such as morphological analysis, part-of-speech tagging, parsing, and sentiment analysis. Throughout the course, we will implement many of the deep learning techniques using Google’s Tensorflow library.

Course title: Discriminative Linguistics
Link: http://campus.uni-tuebingen.de/20171e153570
Course type: Hauptseminar
Contact hours: 2
Course coordinator: Ph.D. Michael Ramscar
Course description
This seminar takes an in depth look at recent approaches to characterizing human communication in terms of the discriminative properties of human learning. Whereas traditionally, linguists have considered meaning in compositional terms, discriminative linguistics treats communication as a process in which signals serve to reduce semantic uncertainty. The seminar will consider in depth what this means, relating the approach to human learning processes, as well as to Shannon’s Theory of Information, in which communication is also treated as a deductive process aimed at uncertainty reduction. As well as considering the theory and background of discriminative linguistics, the course will look at the application of discriminative models across a
range of topics including language learning, morphology, speech, reading and the way that
discriminative models can be used to shed light on lexical distributions. For assessment
purposes, students are required to write an extended term paper on one of the topics discussed in
the course. At the end of this course, participants will have an understanding of current literature
on discriminative linguistics.

**Course title:** Flying Robots  (Course number: INF4364)  
**Link:** http://campus.uni-tuebingen.de/20171e150773  
**Course type:** Internship  
**Contact hours:** 4  
**Course coordinator:** M.Sc. Radouane Ait-Jellal, M.Sc. Dingshen Sun, M.Sc. Ma Wang

**Course title:** Fundamentals of Sensorimotor Integration (Mo) (4085)  
**Link:** http://campus.uni-tuebingen.de/20171e150632  
**Course type:** Lecture  
**Contact hours:** 2  
**Course coordinator:** apl. Prof. Dr. rer. nat. Uwe Ilg  
**Course description**  
The lecture provides an overview of sensorimotor integration in the animal kingdom, including
man. One of the hallmarks of sensorimotor integration is the modification of sensory processing
by ongoing executed motor actions. Since many motor actions are consequences of sensory
stimuli, sensorimotor integration can be explained as a closed-loop feed-back system. The
examples presented in the lecture extend from simple reactions and its learning-related
modifications in the marine snail Aplysia to the complex eye movement pattern reflecting
cognitive abilities in humans. The use of sub-human primates in this research is explained and
justified in detail by different examples. On several occasions, basic principles of learning are
addressed; the neuronal substrate of motor learning and adaptation is explained in detail. Tool
use and tool fabrication observed by the Caledonian crows are introduced. The lecture places
special emphasis on the visual system. Nevertheless, examples from other modalities such as the
electric sense, the mechanism of echolocation and the importance of whiskers for prey detection
in blindfolded seals are presented as well.

**Course title:** Gaze-based Interactive Systems  
**Link:** http://campus.uni-tuebingen.de/20171e153684  
**Course type:** Seminar  
**Contact hours:**  
**Course description**  
Dozent: Shahram Eivazi (Teach@Tübingen) Details of the seminar see
**Additional information**  

**Course title:** Intelligent Systems - Machine Learning for Robotics  (Course number: INFO4177)  
**Link:** http://campus.uni-tuebingen.de/20171e150812  
**Course type:** Lecture/Excercises  
**Contact hours:**  
**Target audience**  
Master students in Computer Science, Mathematics and Physics and associated fields.  
**Course description**
Course title: Machine Learning: Algorithms and Theory  (Course number: INFO4491)  
Link: http://campus.uni-tuebingen.de/20171e150810  
Course type: Lecture/Exercises  
Contact hours:  
Course coordinator: Prof. Dr. rer. nat. Ulrike Luxburg  
Course description  
In many applications and domains, massive amounts of data are collected and processed every day. To be able to make efficient use of such data, there is an urgent need for tools to extract important pieces of information from the flood of unimportant details. Machine learning is a relatively young discipline that tries to deal with this problem, by designing algorithms to analyze large amounts of complex data in a principled way. Machine learning is the core technique in many applications such as spam filtering, object recognition, analyzing user preferences, recommender systems, and so on. Scientific disciplines such as biology, neuroscience, physics, or medicine discover the potential of machine learning methods for analyzing their empirical data. And, last but not least, many large companies like google, Amazon, facebook heavily rely on machine learning techniques. The field of machine learning combines ingredients from several fields: we need to design efficient algorithms to process the amount of data, and we need to ensure that predictions made by machine learning algorithms are statistically sound. The focus of the lecture is on algorithmic and theoretical aspects of machine learning. We will cover many of the standard algorithms, learn about the general principles for building good machine learning algorithms, and analyze their theoretical properties. - Supervised learning problems: Linear methods; regularization; SVMS; kernel methods - Unsupervised learning problems: Dimension reduction (kernel PCA, multi-dimensional scaling, manifold methods); spectral clustering and spectral graph theory - How to model machine learning problems: Bayesian decision theory, loss functions, feature selection, evaluation and comparison of algorithms. Common pitfalls - Online algorithms - Learning theory (no free lunch theorem; generalization bounds; VC dimension; universal consistency; Theorem of Stone) - Low rank matrix methods (collaborative filtering, low rank matrix completion, compressed sensing) The following topics are NOT going to be covered: decision trees, neural networks / deep networks, graphical models, Bayesian approaches to machine learning, reinforcement learning.  
Additional information  
http://www.tml.cs.uni-tuebingen.de/teaching/index.php

Course title: Machine Learning and Artificial Neural Networks in Biomedical Applications  
(Course number: INFO4192)  
Link: http://campus.uni-tuebingen.de/20171e150765  
Course type: Seminar  
Contact hours:  
Course coordinator: Dr. rer. nat. Martin Spüler  
Course description  
The Seminar “Machine Learning and Artificial Neural Networks in Biomedical Applications” covers current topics of signal processing on neural signals (e.g. fMRI, EEG or MEG) for their use in biomedical applications (e.g. neuroprosthetics or brain-computer interfaces, BCIs) and related topics; as well as methods and algorithms applied in those fields.  

Course title: Machine Learning II  
(Course number: NIP02B)  
Link: http://campus.uni-tuebingen.de/20171e150856  
Course type: Lecture/Exercises  
Contact hours: 4  
Course coordinator: Prof. Dr.-Ing. Martin Giese  
Prerequisites  
Machine learning I
Course description
After the course, the participants will have a solid understanding of probability logic, Bayesian networks, inference and learning in Bayesian networks and Markov random fields with exact, (variational) EM and sampling methods. Moreover, the course covers modern stochastic process approaches in Machine learning, such as the Gaussian process and dynamical extensions.

Additional information

Course title: Methodological Frontiers in the Cognitive Neurosciences (Course number: NB04C)
Link: http://campus.uni-tuebingen.de/20171e150854
Course type: Seminar
Contact hours: 2
Course coordinator: Prof. Dr. rer. nat. Andreas Bartels, apl. Prof. Dr. rer. nat. Christoph Braun, Dr. Marc Himmelbach, apl. Prof. Dr. rer. soc. habil. Hans-Gerhard Klinzing, PD Dr. rer. nat. Axel Lindner, Maren Prass
Target audience
Students Graduate School of Neural and Behavioural Sciences (MSc) Students Cognitive Science - Cognitive Neuroscience (MSc) Students Biology - Neurobiology (MSc) [Modul “Einführung in die Neurobiologie”, Anrechnung erfolgt durch Prof. J. Ostwald” (joachim.ostwald@uni-tuebingen.de)]
Additional information

Course title: Motor Systems (Course number: NB03D)
Link: http://campus.uni-tuebingen.de/20171e147286
Course type: Lecture
Contact hours: 2
Course coordinator: o. Prof. Dr. med. Hans-Peter Thier
Prerequisites
Basic knowledge of brain anatomy and mechanical principles.
Course description
The course consists of 10 two-hours lectures. The first lectures introduce several of the major theoretical issues and concepts in the study of motor control such as the degrees of freedom problem or the inverse dynamics problem. This introduction is followed by a presentation of the major brain systems contributing to the control of various types of eye movements, hand movements as well as stance and gait. This overview consists of presentation of the organization of the motor periphery (peripheral nerves and muscles, neuromuscular junction, spinal cord), the architecture of motor and premotor cortices and their role in the guidance of hand movements, and an overview of the major subcortical structures involved in motor control (basal ganglia, cerebellum, superior colliculus), always followed by excursions into the consequences of disease, affecting the structures at issue.
Additional information
http://www.neuroschool-tuebingen-cogni.de/index.php?id=87

Course title: Neural Coding (Course number: NIP01B)
Link: http://campus.uni-tuebingen.de/20171e150858
Course type: Lecture/Excercises
Contact hours: 3
Course title: Neural Data Analysis  (Course number: NIP03B)
Link:  http://campus.uni-tuebingen.de/20171e150857
Course type: Lecture
Contact hours: 4
Course coordinator: PD Dr. rer. nat. Philipp Berens, Dr. rer. nat. Alexander Ecker
Additional information

Course title: Neuropsychology  (Course number: NB06D)
Link:  http://campus.uni-tuebingen.de/20171e150852
Course type: Lecture
Contact hours: 2
Course coordinator: Prof. Dr. med., Dr. phil. Hans-Otto Karnath, Dr. Marc Himmelbach
Prerequisites
Lecture course ‘Methods in Neuropsychology’ by M. Himmelbach (winter semester).
Course description
Neuropsychology bridges the fields of neurology and psychology to unravel and understand the relationship between structure and function in the human brain. Understanding of mental structure can inform theories about brain functions and knowledge about neural mechanisms are useful in understanding mental structure. One approach to understand processes such as language, attention, perception, action, sensory-motor integration, learning, consciousness etc. is to study neurological patients with brain damage. Other techniques used by neuropsychologists are functional neuroimaging (fMRI, PET, MEG) and function interference methods (TMS) in healthy and in brain-damaged subjects. The course will present neuropsychological disorders as well as results obtained by the latter techniques, both with respect to their contribution for our understanding of cognitive functions in humans.
Additional information

Course title: Perception, Cognition & Behaviour  (Course number: NB06A)
Link:  http://campus.uni-tuebingen.de/20171e150853
Course type: Lecture
Contact hours: 2
Course coordinator: Ph.D. Ziad Hafed, Dr. Marc Himmelbach, PD Dr. phil. Tobias Johann Meilinger
Prerequisites
Fundamental knowledge in cognitive neuroscience is required.
Course description
In the first part of this course, we discuss basic aspects of visual perception and its relation with the other sensory modalities, such as audition and touch. The course starts with an historical overview about perception research, discussing the different major epochs (Greek Philosophy, Gestalt Psychology, Behaviourism, Ecological Optics, Cognitive Psychology). The course will
then focus on some of the fundamental aspects of visual perception, such as motion, space, and depth perception. After this foundation is build up, higher-level aspects of visual perception will be discussed, such as scene and object perception, recognition and categorization. Towards the end of the course visual perception will be put in perspective by discussing how vision interacts with the other sensory modalities and by considering vision as an active process in the context of the perception-action loop. In the spatial cognition part of the course, we discuss cognitive processes and neural mechanisms underlying spatial orientation and navigation behaviour in both animals and humans. We start with basic stereotyped spatial behaviour. During the course, more complex spatial behaviour such as homing, exploration, route following, and route planning, the relevant memory concepts (memory for places, for routes, and cognitive maps), and the underlying information processing is introduced. This will be accompanied by discussing the neurobiological underpinnings of spatial orientation and navigation.

Additional information
http://www.neuroschool-tuebingen-cogni.de/index.php?id=87

Course title: Philosophy of Mind and Cognitive Science (Oberseminar)
Link: http://campus.uni-tuebingen.de/20171e148809
Course type: Oberseminar
Contact hours: 3
Course coordinator: Dr. Hong Yu Wong
Course description
For details of all courses students should consult: https://sites.google.com/site/whywong/teaching

Course title: Psychophysical Methods
Link: http://campus.uni-tuebingen.de/20171e151708
Course type: Lecture
Contact hours:
Course coordinator: o. Prof. D.Phil. Felix Wichmann
Additional information
http://www.nip.uni-tuebingen.de/teaching/lectures-seminars

Course title: Regression Modeling Strategies for the Analysis of Linguistic and Psycholinguistic Data
Link: http://campus.uni-tuebingen.de/20171e153506
Course type: Hauptseminar
Contact hours: 3
Course coordinator: Prof. Dr. phil. Harald Baayen
Course description
This course provides practical training in the use of modern regression techniques for understanding linguistic and psycholinguistic data. In the first part of the course, the standard linear model is introduced, with special attention to model diagnostics, methods for dealing with collinearity, the dummy coding of factors, and the use of link functions. The second part of the course introduces the linear mixed-effects model, which is essential for modeling data sets with repeated observations for predictors such as participants in experiments, and linguistic units such as words, sentences, or texts. The focus in this part of the course will be on the interpretation of the parameters for these so-called random-effect factors. The third part of the course moves on to generalized additive models, a relatively recent development in regression modeling that makes it possible to capture nonlinear relations between predictors and the response variable, including wiggly curves and wiggly (hyper)surfaces. Each class consist of a lecture introducing basic concepts and methods, followed by a hands-on lab session in which participants receive training using the R statistical programming environment. Data sets discussed in the lab sessions range from dialectometry to eye-movements and from reaction time data to evoked response...
potentials. By the end of this course, participants will be able to apply state-of-the-art methods in regression to their own datasets, as well as critically evaluate analyses reported in the literature.

**Course title**: Spatial Vision  
**Link**: [http://campus.uni-tuebingen.de/20171e151709](http://campus.uni-tuebingen.de/20171e151709)  
**Course type**: Seminar  
**Contact hours**:  
**Course coordinator**: o. Prof. D.Phil. Felix Wichmann  
**Additional information**  
[http://www.nip.uni-tuebingen.de/teaching/lectures-seminars](http://www.nip.uni-tuebingen.de/teaching/lectures-seminars)

**Course title**: S-Schiene (Mo): Evolutionary Cognitive Neuroscience (4108)  
**Link**: [http://campus.uni-tuebingen.de/20171e150644](http://campus.uni-tuebingen.de/20171e150644)  
**Course type**: Lecture/Excercises  
**Contact hours**: 4  
**Course coordinator**: Prof. Dr. rer. nat. Andreas Nieder  
**Target audience**  
Students of biology, cognitive science, psychology, and related areas  
**Prerequisites**  
Knowledge about fundamental neuroscience, behavior and physiology is required.  
**Course description**  
This 6CP-Module consists of the lecture “Evolutionary Cognitive Neuroscience” (Mo, 4-6 pm) and the seminar “Physiology of Cognition and Behaviour” (Mo, 2-4 pm; see Campus): With a strong emphasis on evolutionary and comparative aspects, the lecture “Evolutionary Cognitive Neuroscience” addresses the behavioural and neural foundations of cognition in the animal kingdom (from insects to humans) from a comparative perspective. Topics comprise: Theory of evolution; evolutionary neuroscience; phylogeny and ontogeny of communication & social cognition; neuroethological model systems of cognition, core knowledge of objects, actions, number, and space. The topic of the seminar “Physiology of Cognition and Behaviour” in the summer term 2016 is “Numerical competence: from behaviour to neurons”. Recent findings from the current literature will be presented and discussed. This seminar aims at elucidating behavioural and neuronal mechanisms and principles giving rise to cognition and complex behaviour.

**Course title**: S-Schiene (Mo): Physiology of Cognition and Behaviour  
**Link**: [http://campus.uni-tuebingen.de/20171e150643](http://campus.uni-tuebingen.de/20171e150643)  
**Course type**: Seminar  
**Contact hours**: 2  
**Course coordinator**: Prof. Dr. rer. nat. Andreas Nieder  
**Target audience**  
Participants of the Module “Evolutionary Cognitive Neuroscience 4108”. Students of Biology and related areas Master students of Cognitive Science  
**Prerequisites**  
Basic knowledge of animal behavior, psychophysics, and neurophysiology  
**Course description**  
Topic of summer term 2016: Numerical competence - from behaviour to neurons Recent findings from the current literature will be presented and discussed. This seminar aims at elucidating behavioural and neuronal mechanisms and principles giving rise to numerical cognition as an example for abstract behaviour. General principles of ethology, psychophysics, functional imaging and single-neuron physiology will be discussed using the example of number representations.

**Course title**: The Body and the Self
Link: http://campus.uni-tuebingen.de/20171e148808
Course type: Hauptseminar
Contact hours: 2
Course coordinator: Dr. Hong Yu Wong
Course description
Hauptseminar: The Body and the Self - Block seminar on Frederique de Vignemont’s Mind the Body (Oxford University Press, 2017) For details of all courses students should consult: https://sites.google.com/site/whywong/teaching

Course title: The structure of Proto Indo-European
Link: http://campus.uni-tuebingen.de/20171e151171
Course type: Proseminar
Contact hours: 2
Course coordinator: MA Fabrício Marcel Ferraz Gerardi
Course description
The Structure of Proto-indo-European Using theoretical linguistics and comparative reconstruction, we will depart from modern and ancient IE languages towards a reconstruction of PIE (phonology, morphology and syntax). Language change (language evolution) will be studied and presented aided by the vocabulary of modern biology, following a tendency within recent (historical) linguistics. Simple computational methods of reconstruction and comparison will also be presented (no previous knowledge required). At the end of the course, students will have a general view of: (1) the structure of PIE and of its descendants, (2) an overview of the methods used in historical linguistics, (3) language evolution.

Course title: Visual Information Processing in Perception and Action
Link: http://campus.uni-tuebingen.de/20171e151894
Course type: Colloquium
Contact hours:
Course coordinator: Prof. Dr. rer. nat. Volker Franz