

<b>Program of Studies:</b>	<b>Master Program Bioinformatics</b>
<b>Name of the module:</b>	<b>Machine Learning</b>
<b>Abbreviation:</b>	<b>I-M-11</b>
<b>Subtitle:</b>	Core lecture
<b>Modules:</b>	Lecture 4 h (weekly) Tutorial 2 h (weekly)
<b>Semester:</b>	1 <sup>st</sup> -3 <sup>rd</sup> Semester / At least once every two years
<b>Responsible lecturer:</b>	Prof. Dr. Matthias Hein
<b>Lecturer:</b>	Prof. Dr. Matthias Hein
<b>Language:</b>	English
<b>Level of the unit/ Mandatory or not :</b>	Graduate course / mandatory elective
<b>Course type/weekly hours:</b>	Lecture 4 h (weekly) Tutorial 2 h (weekly) Tutorials in groups of up to 20 students
<b>Total workload:</b>	270 h = 90 h of classes and 180 h private study
<b>Credits:</b>	9
<b>Entrance requirements:</b>	For graduate students: none
<b>Aims/Competences to be developed:</b>	The lecture gives a broad introduction into machine learning methods. After the lecture the students should be able to solve and analyze learning problems.
<b>Content:</b>	<ul style="list-style-type: none"> <li>- Bayesian decision theory</li> <li>- Linear classification and regression</li> <li>- Kernel methods</li> <li>- Bayesian learning</li> <li>- Semi-supervised learning</li> <li>- Unsupervised learning</li> <li>- Model selection and evaluation of learning methods</li> <li>- Statistical learning theory</li> <li>- Other current research topics</li> </ul>

<b>Assessment/Exams:</b>	<ul style="list-style-type: none"> <li>• Regular attendance of classes and tutorials.</li> <li>• 50% of all points of the exercises have to be obtained in order to qualify for the exam.</li> <li>• Passing 1 out of 2 exams (mid-term, final, re-exam).</li> </ul> <p><b>Grade:</b> Determined from the results of the exams, exercises and potential projects. The exact grading modalities are announced at the beginning of the course.</p>
<b>Literature:</b>	Will be announced before the term begins on the lecture website.