Program of Studies:	**Master Program Bioinformatics**
Name of the module:	**Geometric Modelling**
Abbreviation:	**I-M-7**
Subtitle:	Core Lecture
Modules:	Lecture: 4 h (weekly) Tutorial: 2 h (weekly)
Semester:	1st -3rd semester/at least every two years
Responsible lecturer:	Prof. Dr. Hans-Peter Seidel
Lecturer:	Prof. Dr. Hans-Peter Seidel, Dr. Rhaleb Zayer
Language:	English
Level of the unit/ Mandatory or not:	Graduate course / mandatory elective
Total workload:	270 h = 90 h of classes and 180 h private study; Practical assignments in groups of 3 students (practice) Tutorials consists of a mix of theoretical + practical assignments.
Credits:	9
Entrance requirements:	calculus and basic programming skills
Aims/Competences to be developed:	Gaining knowledge of the theoretical aspect of geometric modelling problems, and the practical solutions used for modelling and manipulating curves and surfaces on a computer. From a broader perspective: Learning how to represent and interact with geometric models in a discretized, digital form (geometric representations by functions and samples; design of linear function spaces; finding "good" functions with respect to a geometric modelling task in such spaces).
Content:	- Differential Geometry Fundamentals - Interpolation and Approximation - Polynomial Curves - Bezier and Rational Bezier Curves - B-splines, NURBS - Spline Surfaces - Subdivision and Multiresolution Modelling - Mesh processing - Approximation of differential operators - Shape Analysis and Geometry Processing

Assessment/Exams:	- Regular attendance and participation. - Weekly Assignments (10% bonus towards the course grade; bonus points can only improve the grade; they do not affect passing) - Passing the written exams (mid-term and final exam). - The mid-term and the final exam count for 50% each, but 10% bonus from assignments will be added. - A re-exam takes place at the end of the semester break or early in the next semester.
Grade:	Will be based on the performance in exams, exercises and practical tasks. The detailed terms will be announced by the module coordinator.
Literature:	Will be announced before the term begins on the lecture website.