

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:	1 st -3 rd Semester / At least once every two years
Responsible lecturer:	Prof. Dr. Hans-Peter Seidel
Lecturer:	Prof. Dr. Hans-Peter Seidel, Prof. Dr. Philipp Slusallek
Language:	English
Level of the unit/ Mandatory or not :	Graduate course / mandatory elective
Course type/weekly hours:	Lecture 4 h (weekly) Tutorial 2 h (weekly) Tutorials in groups of up to 20 students
Total workload:	270 h = 90 h of classes and 180 h private study
Credits:	9
Entrance requirements:	For graduate students: none
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 funktions and samples; design of linear function spaces; finding "good" funktions with respect to a geometric modelling task in such spaces).

Content:	<ul style="list-style-type: none"> - Differential Geometry Fundamentals - Interpolation and Approximation - Polynomial Curves - Bezier and Rational Bezier Curves - B-splines, NURBS - Spline Surfaces - Subdivision and Multiresolution Modeling - Mesh processing - Approximation of differential operators - Shape Analysis and Geometry Processing
Assessment/Exams:	<ul style="list-style-type: none"> - 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. <p>Grade: Will be based on the performance in exams, exercises and practical tasks. The detailed terms will be announced by the module coordinator.</p>
Literature:	Will be announced before the term begins on the lecture website.