Course content for International Master program „Mathematical modeling, computation and optimization"

Course name	Asymptotic and Extreme Value Statistics
Contents and Objectives	Content: • Asymptotic theory in statistics • Law of Large Numbers • Central Limit Theorem, • Law of the Iterated Logarithm • Extreme value statistics • Domain of attraction Objectives of the course: The course addresses the essential knowledge of asymptotic and extreme value statistics. They particularly include limit theorems as the central limit theorem, etc. Situations described by extreme value statistics are essential are discussed. The tools include the domain of attraction and a discussion of the decay of heavy tails. We further classify the three different extreme value distributions based on Fisher–Tippett–Gnedenko theorem. Simulations and the estimation of parameters is of particular interest throughout the course.
Teaching	This course consists of lectures. • Lecture Asymptotic and Extreme Value Statistics (2h/week)
Prerequisites	Probability theory, statistics
Examination	Oral exam (30 minutes)
Credits	4 ECTS points
Frequency	This course is given at least once in 3 years.
Workload	The estimated total working time for this course is 120 hours.
Duration	This course is given during one semester.