Module	***Plasma Physics: Fundamentals***
Code	71063
Instruction language	English
ECTS credits	6
Credit hours	5
Duration	1 semester
Cycle	Each winter semester
Coordinator	Dean of Physics Studies
Lecturer	Dr. Emanuele Poli
Allocation to study programs	Physics M.Sc., elective module, 1st or 2nd semester Wirtschaftsphysik M.Sc., elective module, 1st - 3nd semester
Formal prerequisites	None
Recommended prerequisites	Electrodynamics, Maxwell's equations
Learning objectives	Students who successfully passed this module • know the applications of Plasma Physics in nature and technology • are able to carry out theoretical or experimental research in plasma physics
Syllabus	Foundations of Plasma Physics a) Introduction to Plasma Physics b) Single-Particle Motion c) Collisions and Radiation d) Continuum Description e) Dissipative Plasmas f) Waves in Homogeneous Plasmas g) Kinetic Description
Literature	• Lecture Notes by F. Jenko and E. Poli • T.J.M. Boyd J.J. Sanderson, The Physics of Plasmas, CUP, 2003 • R.J. Goldston P.H. Rutherford, Plasmaphysik, Vieweg, 1998 • F.F. Chen, Plasma Physics, Springer, 1984 • R. Kippenhahn C. Möllenhoff, Elementare Plasmaphysik, BI, 1975 • P.M. Bellan, Fundamentals of Plasma Physics, CUP, 2008 • J. Freidberg, Plasma Physics and Fusion Energy, CUP, 2007 • R.M. Kulsrud, Plasma Physics for Astrophysics, PUP, 2004 • A. Yoshizawa S.-I. Itoh K. Itoh, Plasma and Fluid Turbulence, IoP Publishing, 2003 • P.H. Diamond S.-I. Itoh K. Itoh, Modern Plasma Physics, CUP, 2010 • I.H. Hutchinson, Principles of Plasma Diagnostics, CUP 2005 • C.K. Birdsall A.B. Langdon, Plasma Physics via Computer Simulation, IoP Publishing, 2004 • S. Jardin, Computational Methods in Plasma Physics, CRC Press, 2010

Teaching and learning methods	Lecture (3 hours per week) Exercise (2 hours per week)
Workload	45 hours lecture (attendance time) 30 hours exercise (attendance time) 105 hours self-study and exam preparation Total: 180 hours
Assessment	Written or oral examination. A prerequisite for the participation in the examination is an ungraded course achievement. Form and scope of the examination and of the course achievement are determined and notified by the lecturer at the beginning of the course.
Examination	12080 Fundamentals of Plasma Physics (precourse) 12079 Fundamentals of Plasma Physics
Grading procedure	The module grade is the examination grade.
Basis for	Module *Plasma Physics: Applications*