Modules:

ECThPhysics **Elective Courses Theoretical Physics**
physics70c **Elective Advanced Lectures: Theoretical Physics**

Course: General Relativity and Cosmology (T)

Course No.: physics754

Category	Type	Language	Teaching hours	CP	Semester
Elective	Lecture with exercises	English	3+2	7	ST

Requirements for Participation:

Preparation:
physik221 and physik321 (Theoretical Physics I and II)
Differential geometry

Form of Testing and Examination:
Requirements for the examination (written): successful work with the exercises

Length of Course:
1 semester

Aims of the Course:
Understanding the general theory of relativity and its cosmological implications

Contents of the Course:
Relativity principle
Gravitation in relativistic mechanics
Curvilineal coordinates
Curvature and energy-momentum tensor
Einstein-Hilbert action and the equations of the gravitational field
Black holes
Gravitational waves
Time evolution of the universe
Friedmann-Robertson-Walker solutions

Recommended Literature:
S.Weinberg; Gravitation and Cosmology (J. Wiley & Sons 1972)
R. Sexl: Gravitation und Kosmologie, Eine Einführung in die Allgemeine Relativitätstheorie (Spektrum Akadem. Verlag 5. Aufl 2002)
L.D. Landau, E.M. Lifschitz; Course of Theoretical Physics Vol.2: Classical field theory (Butterworth-Heinemann 1995), also available in German from publisher Harry Deutsch