General Relativity and Cosmology (T) - physics754

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

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