Georg-August-Universität Göttingen **Modul B.Phy.5654: Vorlesung: Principles and Applications of Synchrotron and Free Electron Laser Radiation** *English title: Lecture: Principles and Applications of Synchrotron and Free Electron Laser Radiation*	3 C 4 SWS

Lernziele/Kompetenzen: **Learning objectives:** The aim of the course is the close connection of teaching in the field of X-ray physics with the work on major research centres, in particular research in photon science at DESY. During the lecture the students receive an introduction to research on synchrotron radiation and free electron laser radiation: generation of the radiation and characteristics of the sources, basics of accelerator physics, experimental structures (beam tubes), fundamentals of X-ray diffraction and X-ray spectroscopy as well as X-ray short-time physics. In the block course they learn the application of X-ray physical methods (with annually changing emphases): coherent mapping, mathematical description, applications in biophysics, molecular physics, crystallography, short-term physics, etc. (each as an introduction). **Competencies:** After successfully completing the module, students have … • gathered fundamental knowledge of the principles of generating synchrotron radiation and free electron laser radiation as well as their applications; • developed abilities in the mathematical description of X-ray diffraction on selected current examples from biophysics, molecular physics, crystallography etc.	**Arbeitsaufwand:** Präsenzzeit: 56 Stunden Selbststudium: 34 Stunden

Lehrveranstaltung: Lecture *Inhalte*: Introduction to research with synchrotron radiation and radiation of free electron lasers: generation of radiation and characteristics of the sources, basics of accelerator physics, experimental setups (beam tubes), basics of X-ray diffraction and X-ray spectroscopy, X ray short-time physics.	SWS
Lehrveranstaltung: Block course Desy Campus, Hamburg (2,5 Days) *Inhalte*: Introduction to the applications of X-ray physical methods (with annual changing emphases) using high-energy radiation: Introduction to coherent mapping, mathematical description of X-ray imaging, applications in biophysics, molecular physics, crystallography, short-time physics, etc.	
Prüfung: Mündlich (ca. 45 Minuten) **Prüfungsanforderungen:** Understanding of the basic research in physics applied to synchrotron radiation and free electron laser radiation: generation of the radiation and characteristics of the sources, basics of accelerator physics, experimental setups (beam tubes), basics of X-ray diffraction, X-ray imaging and X-ray spectroscopy; basics of X-ray short-time physics,	3 C