



UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION

Predmet:	Rentgenske spektroskopske metode
Subject Title:	X-ray spectroscopic methods

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
FIZIKA PHYSICS	-	1 ali 2	1 ali 2

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Labor work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
45	30	-	-		375	15

Nosilec predmeta / Lecturer:

Jeziki / Languages:
Predavanja / Lecture:
Vaje / Tutorial:

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Prerequisites:

Vsebina:

- Pregled rentgenskih spektroskopskih metod:
 - izviri rentgenske svetlobe
 - rentgenske difrakcijske spektroskopije
 - rentgenske absorpcijske spektroskopije
 - rentgenska fluorescenčna spektroskopija
 - spektroskopija elektronov
- Metodi EXAFS in XANES:
 - teoretične osnove
 - priprava vzorcev
 - izvedba meritev
 - obdelava meritev
 - interpretacija rezultatov
 - tipični primeri

Content (Syllabus outline):

- Survey of x-ray spectroscopic methods:
 - x-ray sources
 - x-ray diffraction spectroscopies
 - x-ray absorption spectroscopies
 - x-ray fluorescent spectroscopy
 - electron spectroscopy
- EXAFS and XANES:
 - theory
 - sample preparation
 - measurements
 - data processing
 - interpretation of results
 - typical examples

Temeljni literatura in viri / Textbook:

B.K. Agarwal, X-ray Spectroscopy: An Introduction (Springer Series in Optical Sciences), Springer-Verlag Berlin and Heidelberg GmbH & Co. KG (1991).
D. C. Koningsberger, R. Prins, X-ray absorption spectroscopy (principles, applications, techniques of EXAFS, SEXAFS and XANES). John Wiley and Sons, New York (1988).
B. K. Theo, EXAFS: Basic Principles and Data Analysis (Springer, Berlin, 1986).

Cilji:

Objectives:

Študentje si zgradijo pregled nad rentgenskimi spektroskopskimi metodami v atomski fiziki, razumejo njihove fizikalne principe in možnosti uporabe.

Students obtain an overview of x-ray spectroscopic methods in atomic physics, they understand physical principles and range of application of the methods.

Predvideni študijski rezultati:

Znanje in razumevanje:
Študentje poznajo prednosti in omejitve posameznih spektroskopskih metod in znajo izbrati primerno metodo ali kombinacijo metod za dani problem, pripraviti vzorce, poiskati možnosti merjenja in obdelave ter interpretirati rezultate.
Za metodi EXAFS in XANES znajo tudi sami obdelati izmerjene spektre.

Prenesljive/ključne spretnosti in drugi atributi:
Kritičen odnos do zahtev in rezultatov posameznih merilnih metod, pripravljenost na samostojno delo, spretnost načrtovanja in izvedbe eksperimentov.

Intended learning outcomes:

Knowledge and Understanding:
Students understand advantages and limitations of particular spectroscopic methods and are able to select the appropriate one or their combination for an actual problem. They are able to prepare samples, find possibilities where and how to measure and process the data, they can interpret the results.
Students are able to process EXAFS and XANES data by themselves.

Transferable/Key Skills and other attributes:
Critical attitude to demands and results of particular methods, preparedness for individual work, skills at planning and conducting of the experiment.

Metode poučevanja in učenja:

Predavanja
Seminarsko delo

Learning and teaching methods:

Lectures
Seminar work

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Seminarska naloga Ustni izpit	50 % 50 %	Seminar work Oral exam