



שם הקורס

שיטות מתקדמות בדיפרקציית אבקות

מרצה

ד"ר דוד לוי

סמסטר

ב' תשפ"א

דרישות הקורס

מבוא לקריסטלוגרפיה ואנליז (05814132)

הרכב הציון הסופי

בחינה סופית

מבנה הקורס

נושא השיעור ותכני השיעור
(מטלות, רשימת קריאה, משימות וכיו"ב)

תאריך /
מס' שיעור

Introduction-Instrumental:

- Basic of diffraction theory
- From single crystal to powder diffraction
- Diffraction geometry: Parallel beam, Bragg Brentano; Flat sample-capillary, Grazing incidence diffraction, High-Resolution Diffraction
- Optimization of data collection: Optic; Detectors

2h-3/3/21

Data analysis

- Peak profile analysis and instrumental effect
- Microstructure analysis
- Data reduction: Background stripping, Profile smoothing
- Profile analysis: Instrumental broadening, Grain size and microstrain
- Qualitative analysis: PDF database, Search match algorithm

2h-9/3/21

Structural analysis

- Whole Profile fitting: Pawley method and LeBail method
- Cell determination, Cell parameter refinement
- Rietveld method and its application
- Quantitative analysis

2h-16/3/21

Introduction to the structural resolution

- Cell indexing
- Direct method
- Simulated annealing
- Pair Distribution Function Approach (PDF)

2h-6/4/21

Not- conventional technique

- Synchrotron light and neutron diffraction
- Not ambient techniques

2h-13/4/21



Thin Film Analysis a. Rocking curve and texture analysis	2h-20/4/21
Instrumentation and sample preparation (practical): a. X-ray tube b. Optics c. Detectors d. Flat-plane sample e. Capillary	2h-27/4/21
Data collection in laboratory (practical) a. Instrumental error b. Data collection technique	2h-4/5/21
Computer exercise on data analysis (practical): a. Data reduction b. Qualitative analysis c. Quantitative analysis	2h-11/5/21
Computer exercise on Whole Profile Fitting (practical) a. Whole profile Fitting b. Peak profile analysis c. Cell parameter determination (Pattern indexing)	2h-18/5/21
Computer exercise on structure resolution (practical) a. Structure determination of easy phase from scratch	2h-25/5/21
	2h-1/6/21
	2h-15/6/21
	קריאת חובה
	Lessons files
	קריאת רשות
<p>Powder diffraction : theory and practice; Dinnebier, Robert E.; Billinge, S. J. L. Introduction to X-ray powder diffractometry; Jenkins, Ron Thin film analysis by X-ray scattering; Birkholz, Mario-- Fewster, Paul F. Genzel, Christoph</p>	
	הערות
The course will be in English	