PHYS 4P70/5P12 - Condensed Matter Physics I

Instructor:

Prof. D, Crandles
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Meeting Times: Mon, Thurs 9-10.30 - GSB408

Textbook: The primary textbook is *The Oxford Solid State Basics*, Steven H. Simon, Oxford University Press (2013) . An electronic copy of this book is available in the library.

Supplementary Texts: Good textbooks on Solid State Physics include:

1. *Introduction to Solid State Physics* Charles Kittel
2. *Solid State Physics*, by N. Ashcroft and D. Mermin
3. *Solid State Physics: Essential Concepts*, by David W. Snoke (Advanced)

Brock Calendar Entry
Crystal structures and crystal binding; the vibration of atoms in solids and the thermodynamics of solids; introduction to transport properties of solids.
Prerequisites: PHYS 3P41- Statistical Physics I and 3P70 - Introduction to Quantum Mechanics

Topics

1. Crystal Structures - Direct Lattice
2. Reciprocal Lattice, Xray and Neutron Diffraction
3. Thermal Properties - Heat Capacity
4. Thermal Properties - Vibrational Dispersion
5. Electrical Properties of Metals

Course Policies

- All students are required to know and abide by the Academic Integrity Policy of Brock University. The University takes Academic Misconduct extremely seriously and will follow its strict procedures to the letter in all cases.

  https://brocku.ca/academic-integrity/

- Late summaries/questions will NOT be accepted.
- Note that the last day to withdraw without academic penalty is November 2, 2021

Marking Scheme

Daily Questions	10%	Before each class (starting sep. 13 class which is lecture #1) based on videos/ assigned problems. You are strongly advised to attempt problems before class, or do them after class. Email the question to dcrandles@brocku.ca by 8pm TWO days before class. Monday class, questions due saturday 8pm Thursday class, quetions due tuesday 8pm For example, monday Sep. 13 class this means saturday Sep. 11.
Concept Quizzes	10%	During Class a set of questions will be asked based on fundamental physics behind topic or details of that day's condensed matter physics topic
Assignments	60 %	Approximately weekly
Oral Final Exam	20 %	Multiple-choice questions and short problems