

**Chemistry 160:477/577**  
**SOLID STATE CHEMISTRY**

**Syllabus**

**Instructor** Prof. Jing Li (Rm. 3104, Chemistry and Chemical Biology Building, 445-3758, [jingli@rutgers.edu](mailto:jingli@rutgers.edu))

**Time and Place** Tuesday/Thursday, 10:55am-12:15pm

**Office Hours** Friday 10:30am-12:00pm or by Appointment

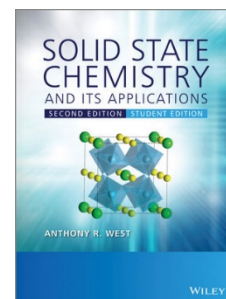
**Course Website** <https://sakai.rutgers.edu/portal>

**Sakai Helpdesk** 848-445-8721 (Available 24/7), [sakai@rutgers.edu](mailto:sakai@rutgers.edu)

**Text and Reference Books:**

Textbook:

- A. R. West: Solid State Chemistry and Its Applications (2<sup>nd</sup> Ed, Student Edition, Wiley 2014, ISBN: 978-1-119-94294-8)



Reference Books:

- L. E. Smart, E. A. Moore: Solid State Chemistry: An Introduction (4<sup>th</sup> Ed., CRC Press 2012, ISBN 9781439847909)
- T. A. Albright, J. K. Burdett and M.-H. Whangbo: Orbital Interactions in Chemistry (2<sup>nd</sup> Ed, Wiley & Sons 2013, ISBN: 978-0-471-08039-8)
- S. E. Dann: Reactions and Characterization of Solids (RSC Publishing 2000, ISBN: 978-0-85404-612-6)
- A. F. Wells: Structural Inorganic Chemistry (5<sup>th</sup> Ed, Oxford University Press 1984, ISBN-10: 0198553706)
- Cheetham and Day: Solid State Chemistry: Techniques (Clarendon Press 1990, ISBN-10: 0198552866)
- Cheetham and Day: Solid State Chemistry: Compounds (Clarendon Press 1992, ISBN-10: 0198551665)
- P. A. Cox: The Electronic Structure and Chemistry of Solids (Oxford 1987, ISBN-10: 0198552041)
- Wold, Aaron, Dwight: Solid State Chemistry (Springer 1993, ISBN 978-94-011-1476-9)
- R. Hoffmann: Solids and Surfaces: A Chemist's View of Bonding in Extended Structures (Wiley-VCH 1989, ISBN: 978-0-471-18710-3)
- J. K. Burdett: Chemical Bonding in Solids (Oxford 1995, ISBN-10: 0195089928)

**Learning Goals:** To understand the basic concepts and principles of solid state chemistry by exploring synthesis, structure, chemical bonding, physical properties and applications of various solid materials, and to achieve a fundamental understanding of the structure-property correlation in these materials, with an

emphasis on crystalline solids. The department learning goals are met by this course.

- Academic Integrity Policy:** <http://academicintegrity.rutgers.edu/>  
<http://academicintegrity.rutgers.edu/academic-integrity-policy/>
- Lecture Notes** Lecture notes will be posted on the course website (Sakai). Access will be provided to all students enrolled in the course.
- Problem Sets** Questions will be selected from the textbook and from other sources. Problem sets will not be graded but the key to each question will be provided.
- Term Paper:** Students are required to write and present a term paper on a current topic in areas of Solid State Chemistry.
- Project:** Each student will perform band structure calculations of an assigned crystalline compound using selected software packages and submit results by due date.
- Exams:** There will be a midterm and a final exam. Final exam date and time can be found at: <http://finalexams.rutgers.edu/> or [scheduling.rutgers.edu/scheduling/exam-scheduling/final-exam-schedule](http://scheduling.rutgers.edu/scheduling/exam-scheduling/final-exam-schedule)
- Grading Policy:** Midterm Exam 30%; Final Exam 40%, Term Paper 25% (Report: 12%, Oral Presentation and Participation: 13%), Project 5%. All work must be completed by the due date to avoid reduction of credits.
- Self-Reporting Absence:** Students are expected to attend all classes; if you must miss a class, please use Rutgers absence reporting website: <https://sims.rutgers.edu/ssra/> to indicate the date and reason for your absence. An email will be automatically sent to me.
- Resources:** <http://www.wiley.com/go/west/solidstatechemistrystudent/>  
<http://www.crystalmaker.com/>  
<http://symmetry.otterbein.edu/>  
<http://csi.chemie.tu-darmstadt.de/ak/immell/tutorials/symmetry/>  
<http://www.3dchem.com/inorganic.html>  
<http://homepage.univie.ac.at/nikos.pinotsis/spacegroup.html>  
[http://firstyear.chem.usyd.edu.au/calculators/solid\\_state.shtml](http://firstyear.chem.usyd.edu.au/calculators/solid_state.shtml)  
<http://www.crystallographiccourseware.com/>  
<http://rcsr.anu.edu.au/>  
<https://crystalsymmetry.wordpress.com/230-2/>  
<https://crystalsymmetry.wordpress.com/nets/mof-nets/>