Oral Qualifying Exam - Physical Metallurgy

Incomplete list of topics to be covered. Coverage is at the level of understanding typified by the suggested texts and courses, essentially at the senior undergraduate level for majors in Metallurgy or concentrating in metals in Materials Science and Engineering. The principles should be understood as well as the application of principles to the case of metallic materials.

Topics

- Structure (crystal structure, microstructure)
- Characterization and properties
- Mass transport
- Defects
- Thermodynamics and phase diagrams
- Deformation
- Mechanical behavior (yielding, creep, fatigue, fracture, etc.)
- Annealing and sintering
- Phase Transformations
- Processing

Texts

R. Abbaschian and R. Reed-Hill, "Physical Metallurgy Principles," PWS-Kent Publishers.
P. Haasen, "Physical Metallurgy," Cambridge University Press.

Typical UIUC courses in which this material is covered at the appropriate level: MSE 401, 402, 405, 406, 440, 441, 442, 443