

Course title: Introduction to Transport Phenomena in Materials Processing

Course code: MS3072

Objectives: This course is designed to introduce transport phenomena to material students and to help them familiar with the fundamental principles of heat flow, fluid flow, mass transport and reaction kinetics.

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Text book

S. Kou, "Transport Phenomena and Materials Processing", John Wiley and Sons Inc. New York, 1996.

References

1. R.B. Bird, W.E. Stewart, and E.N. Lightfoot, "Transport Phenomena", John Wiley and Sons, New York, 2nd Edition, 2002.
2. D.R. Gaskell, "An Introduction to Transport Phenomena in Materials Engineering", Macmillan Publication Co. New York, 1992.

I. Course contents

Part I Introduction to transport Phenomena

1. Introduction to fluid flow
2. Introduction to heat transfer
3. Introduction to mass transfer
4. Fluid flow, heat transfer, and mass transfer: Similarities and coupling
5. Boundary conditions at interfaces

Part II Applications of transport phenomena in materials processing

6. Selected topics in processing technologies
7. Selected topics of fluid flow in materials processing

II. Grading

- ✓ Quizzes (15%) and Homework (15%)
- ✓ Mid-term Test 1 (35%)
- ✓ Final Exam (35%)