

POD 24 : Lecture Summaries

- 1) Fourier's Law & Conductivity
 - how cond. is diff for gases, liquids, solids
 - cond of metals = elec. cond
 - parallel between mass, mom, energy flux
 - concept of ht flux

- 2) one-D ht cond on solids
 - deriv. of eq'n
 - parallel w/ mom transp in unid. flow
 - cond in a slab
 - continuous τ & ht flux at int.
 - overall ht trans coef (resist. in series)

- 3) Ht trans. w/ gen.
 - ht trans in cyl geom
 - parallel between T in wire, Poise. flow
 - ext. ht transf. from heated sphere
 - Stokes paradox

- 4) Cooling fans & ht trans coef.
 - correlations for ext ht transf
 - scaling w/ Re , Pr

5) Nusselt & Biot & Quenching of a sph.

- lumped cap model
- ext & internal resist.
- sep. var. solⁿs

6) SL & Start up of heated slab

- general form of SL problems
- ⇒ subtract a symp. solⁿ to render BC homog!
- what you want to know
 - asymp, lead e.g., lead f^n , everything

7) Matrix methods / num. solⁿs

- how to solve problems numerically if no analytic solⁿ exists
- get the answer!!