

CHM 221A


Basic Physical Chemistry I

First course handout
2023 - Odd Semester

Instructor: Mainak Sadhukhan

Indian Institute of Technology Kanpur

- Recapitulation of basics of thermodynamics
- Carnot theorem and Claussius inequality
- Formalistic development of Thermodynamics
- Applications of thermodynamics in chemistry: Solutions and phase equilibria
- Equilibrium and non-equilibrium electrochemical processes
- Non-equilibrium thermodynamics
- **Finite-time thermodynamics**¹

¹Topics in **red** will be covered if time permits 

- Assignments may be given for practice
- Attendance will cover 10% marks
- A surprise test will cover 10% marks
- Mid-semester examination will cover 40% marks
- End-semester examination will cover 40% marks
- No pro-rating is admissible
- End-semester make-up can only be admissible for medical emergency, properly approved by authorities (SPGC/SUGC)

Books

- 1 P. W. Atkins and Julio de Paula, Physical Chemistry.
- 2 H. B. Callen, Thermodynamics and an introduction to thermostatistics.
- 3 G. W. Castellan, Physical Chemistry
- 4 S. R. de Groot and P. Mazur, Non-Equilibrium Thermodynamics
- 5 J. O'M. Bockris and A. K. N. Reddy, Modern electrochemistry, Volume 1
- 6 J. O'M. Bockris, A. K. N. Reddy, and M. Gamboa-Aldeco, Modern Electrochemistry, Volume 2A
- 7 S. Glasstone, An introduction to electrochemistry

Online resources

The instructor will mention possible online resources during teaching.

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The students are very much encouraged to contact the instructor whenever needed