CHM
322A/322
**Physical
Chemistry-II**

Instructor:
Mainak
Sadhukhan

# CHM 322A/322
# **Physical Chemistry-II**
## First course handout
## 2024 - Even Semester

### Instructor: Mainak Sadhukhan

Indian Institute of Technology Kanpur

January 3, 2024

CHM
322A/322
**Physical
Chemistry-II**

Instructor:
Mainak
Sadhukhan

# Topics to be covered

- Recapitulation of basics of classical mechanics and thermodynamics
- Kinetic theory of gas and motivation for generalized frameworks
- Formalistic development of equilibrium statistical mechanics
- Applications of equilibrium statistical mechanics in macroscopic problems
- Quantum mechanical extension and applications
- Generalized formalism of non-equilibrium statistical mechanics: correlation functions
- Smoluchowski, Langevin and Kramers theory: Theory of chemical reactions

CHM
322A/322
**Physical
Chemistry-II**

Instructor:
Mainak
Sadhukhan

# Grading policy

- Assignments may be given for practice
- Attendance will cover 10% marks
- Mid-semester examination will cover 40% marks
- End-semester examination will cover 50% marks
- No pro-rating is admissible
- End-semester make-up can only be admissible for medical emergency, properly approved by authorities (SPGC/SUGC)

CHM
322A/322
**Physical
Chemistry-II**

Instructor:
Mainak
Sadhukhan

# References

**Books**

1. L. D. Landau and E. M. Liftsitz, Classical Mechanics, Courses in theoretical physics Vol. 1, Elsevier
2. H. B. Callen, Thermodynamics and an introduction to thermostatistics.
3. J. W. Gibbs, Elementary Principles in Statistical Mechanics (Check project Gutenberg)
4. L. D. Landau and E. M. Liftsitz, Statitical Mechanics-I and II, Courses in theoretical physics Vol. 5 and 9, Elsevier
5. K. Huang, Statistical Mechanics, Wiley
6. R. K. Pathria and P. D. Beal, Statistical Mechanics, Academic Press
7. R. Zwangzig, Nonequilibrium Statistical mechanics, Oxford university Press

**Online resources**

The instructor will mention possible online resources during teaching.

CHM
322A/322
**Physical
Chemistry-II**

Instructor:
Mainak
Sadhukhan

# Contact informations

**Office:** Office 4, C' block, Old-SAC complex
**Email:** mainaks@iitk.ac.in
**Phone:** 0512-259-2062
**Homepage:** `http://home.iitk.ac.in/~mainaks`
**The students are very much encouraged to contact the instructor whenever needed**