



EDO UNIVERSITY IYAMHO
Department of Industrial Chemistry
CHM 314: Advanced Physical Chemistry

Instructor: *Mr Inobeme Abel*, email: inobeme.abel@edouniversity.edu.ng

Lectures: Mon. 8am – 9.00 am, Wed. 10.00am – 12.00 pm. LT5, phone: (+234) 8036237514

Office hours: Thurs. & Fri., 2.00 to 4.00 pm, Office: F.O.S Rm 7.

General overview of lecture:

This course takes the learners through a review of Gibbs Function and then introduces the concepts of Chemical and statistical thermodynamics. The concepts of Ideal and Non-Ideal solutions are also discussed accordingly. Fundamental properties of electrolytes and Colligative properties are also treated. The practical applications of Gibbs function and thermodynamic principles, theories and derivations in real life situations will also be considered.

Prerequisite:

Advanced Physical Chemistry is a course for students in the Department of Chemistry and Biochemistry. The intended learners for this course are expected to have passed their course in Basic Physical Chemistry which is a prerequisite to this. The course shall include lectures and embedded practical exercises.

Learning outcomes:

At the end of this course the students should be able to:

- i. Calculate Gibb's free energy, enthalpy and entropy for various thermodynamic systems.
- ii. Outline the colligative properties of solutions.
- iii. Explain the functioning of heat engines Carnot engine and other related systems.
- iv. Determine molecular weights of unknown compounds using the idea of colligative properties.
- v. Classify thermodynamic systems based on their properties: isochoric, adiabatic isobaric etc.



- vi. Solve given problems based on the laws of thermodynamics.
- vii. Apply the laws of thermodynamic to real life situation.

Assignments:

Assessment for this course shall include three (3) assignments together with the mi-term test and final examination. Students will also be expected to make term paper presentation towards the end of the semester. Individual and group projects will also be assessed.

Grading:

Continuous assessment (CA) shall be assigned 30 % while the final examination takes 70%. Distribution of marks for the CA shall be as follows: 10% for home works; 10% for projects and 10% for midterm test. The Final exam is comprehensive.

Textbook: The recommended textbooks for this course are as follows:

Title: *Physical Chemistry*

Authors: Atkins, P. and De Paula, J.

Publisher: Freeman Publisher,

Edition: 8th ed

Year: 2006

Title: *Chemistry Precision and Design*

Author(s): Biddle, V. and Parker, G.

Publisher: Pensacola: Pensacola Christian College.

ISBN: 0-321-32221-5.

Year: 2000

Title: *Kinetics and Mechanism*

Author: Moore J.W. and Pearson, R.G.

Publisher: John Wiley,

Edition: 3rd ed

Year: 2000

Courseware: - CHM 314 – Advanced Physical Chemistry

The courseware for CHM 314 – Advanced Physical Chemistry is outline below. The recommended textbooks will be very relevant in covering this content.



- 1: A review of Gibb's function
- 2: Problems solving on Gibb's parameters, entropy and enthalpy
- 3: Thermodynamic systems: adiabatic, isochoric, isothermal, cyclic process etc
- 4: Laws of Thermodynamics and Applications
- 5: Work-done in reversible and non-reversible expansions
- 6: Heat engines, Carnot Carnot cycle
- 7: Ideal solutions
- 9: Non- ideal solutions
- 9: Properties of Electrolytes
- 10: Colligative properties
- 11: Determination of molecular weights of Electrolytes