

CHE 31. Introduction to Chemical Engineering Calculations (Credit: 3 Units)

The course is intended to provide students a clear overview of the field of chemical engineering and introduce them to the elementary principles involved in the analysis of chemical processes with emphasis on material and energy balance calculations as applied to steady-state chemical systems.

Course Prerequisites: **CHEM 32 and MATH 37**

Professor-in-charge: Prof. Manolito E. Bambase Jr.

A. LECTURE TOPICS

Part 1. Fundamental Concepts in Chemical Engineering Calculations

- Lecture 1. Units and Dimensions
- Lecture 2. Regression and Nonlinear Axes
- Lecture 3. Fundamental Process Variables
- Lecture 4. The Chemical Equation and Stoichiometry

Part 2. Gasses and Phase Equilibrium

- Lecture 5. Ideal Gas Calculations
- Lecture 6. Real Gas Relationships
- Lecture 7. Saturation
- Lecture 8. Vapor-Liquid Equilibria

Part 3. Material Balances

- Lecture 9. The Material Balance
- Lecture 10. Program of Analysis of Material Balance Problems
- Lecture 11. Solving Material Balance Problems Involving Non-Reactive Processes
- Lecture 12. Solving Material Balance Problems Involving Reactive Processes
- Lecture 13. Combustion Processes
- Lecture 14. Recycle, Bypass, and Purge Calculations

Part 4. Energy Balances

- Lecture 15. Concepts and Units
- Lecture 16. Calculation of Enthalpy Changes
- Lecture 17. Solving Energy Balance Problems Involving Non-Reactive Processes
- Lecture 18. Solving Energy Balance Problems Involving Reactive Processes

B. REFERENCES

1. **Elementary Principles of Chemical Processes** (3rd Edition) by Richard M. Felder and Ronald W. Rousseau
2. **Basic Principles and Calculations in Chemical Engineering** (7th Edition) by David M. Himmelblau and James B. Riggs

C. CLASS REQUIREMENTS AND GRADING

1. Point system will be used in assessing the student's progress in the course.

2. The requirements for grading shall be composed of:

1	Mid-Term Exam (Parts 1 & 2)	200 pts
1	Pre-Final Exam (Parts 3 & 4)	200 pts
10	Assessment Tests (20 pts each)	200 pts
4	Class Recitation (25 pts each)	100 pts
PREFINAL STANDING		700 pts
	Final Examination	300 pts
FINAL STANDING		1000 pts

3. A student with a prefinal standing of ≥ 490 (or < 250) will be included in the exemption list and may opt not to take the final examination.

4. The final grade of the student in the course is determined as follows:

Exempted from taking the final examination	Not exempted from taking the final examination	FINAL GRADE
670 – 700	956 – 1000	1.00
640 – 669	911 – 955	1.25
610 – 639	866 – 910	1.50
580 – 609	821 – 865	1.75
550 – 579	776 – 820	2.00
520 – 549	731 – 775	2.25
490 – 519	686 – 730	2.50
	641 – 685	2.75
	600 – 640	3.00
	550 – 599	4.00
< 250	< 550	5.00

D. CLASS POLICIES

1. A student who misses a long exam must present an official excuse slip from the college secretary on his return to class in order to have a make-up exam. Grace period for the make-up exam is one week after the student’s return to class.
2. Questions regarding the checking of exam papers will be entertained only within one week after the return of corrected exam papers.
3. A student caught cheating will be penalized with a grade of 5.0 for the course.
4. University policy on attendance will be followed.

E. IMPORTANT DATES

Jun 16 (W) - Last day for late registration

Aug 6 (F) - Last day for dropping of subjects without evaluation

Aug 9 (M) - CHE 31 Mid-Term Exam (6 – 9 PM)

Sep 3 (F) - Last day for dropping of subjects with “PASS” or “FAIL” evaluation

Sep 13 (M) - Last day of holding activities

Oct 7 (Th) - Last day of classes
- CHE 31 Pre-final Exam (6 – 9 PM)