



ChE 100

Introduction to the Chemical Engineering Profession

Course Description: Introduction to chemical engineering: history and emerging trends in various fields. The role of chemical engineers in the development of society. The chemical engineering profession. Overview of unit operations, mass and energy balances, and chemical reaction engineering.

Course Prerequisite: Chem 16

Course Credit: 1 unit (1 h lecture)

Program Educational Objectives (BS Chemical Engineering)

The program aims to educate students such that three to five years from graduation, they:

1. take leadership roles in their respective fields and/or effectively work in or manage a team;
2. are equipped with the extensive knowledge and relevant skills necessary to succeed in their chosen careers and to become responsive citizens;
3. are able to demonstrate strong research & innovative capability as they recognize and address opportunities and challenges in their respective spheres of influence;
4. have shown strong commitment to the ethical practice of their profession; to health, safety and environment; and service to society.

Course Outcomes

At the end of this course, the students must be able to:

1. Define “chemical engineering”, and identify the scope of work for a chemical engineer;
2. Enumerate and distinguish the various fields in chemical engineering;
3. Summarize existing Philippine and international laws relevant to the practice of the chemical engineering profession;
4. Recognize and understand the impact of chemical engineering to modern society;
5. Identify and commit themselves as future engineers and contributors to nation-building; and
6. Perform basic mass and energy balances

Student Outcomes Satisfied by Course Outcomes

- [a] Ability to apply knowledge of mathematics and science to solve engineering problems
- [f] Understanding of professional and ethical responsibility
- [h] Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- [i] Recognition of the need for, and an ability to, engage in life-long learning
- [j] Knowledge of contemporary issues

Course Content

| Week | Topic |
|-----------|---|
| Weeks 1-2 | <ol style="list-style-type: none">1. What is Chemical Engineering?<ol style="list-style-type: none">1.1 Definition and scope1.2 History and development1.3 Chemical process industries1.4 Fundamental topics in chemical engineering |

| Week | Topic |
|-------------|---|
| Weeks 3-4 | 2. Chemical Engineering and Society 2.1 The role of chemical engineers 2.2 The chemical engineering profession 2.2.1 Licensure and professional regulation 2.2.2 Local and international organizations 2.2.3 Laws and ethics in the profession |
| Weeks 5-10 | 3. Foundations of Chemical Engineering Problem-Solving 3.1 Units and Dimensions 3.2 Process Variables 3.3 Mass Balances |
| Weeks 11-13 | 4. Contributions of Chemical Engineering 4.1 Electronics 4.2 Energy 4.3 Environment 4.4 Food 4.5 Materials 4.6 Medicine |
| Weeks 14-16 | 5. Major Fields of Chemical Engineering 5.1 Biochemical engineering 5.2 Electrochemical engineering 5.3 Energy and thermal systems engineering 5.4 Environmental engineering 5.5 Materials engineering 5.6 Process systems engineering |

Course Assessment

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|-------------------|-----|
| Student Profile | 10% |
| Quiz & Case Study | 20% |
| Written Exam | 30% |
| Synthesis Video | 20% |
| Term Paper | 20% |

Course Policies

1. Class participation, both in-class and online, is highly encouraged. To promote an open atmosphere for discussion, please keep your phones and other unnecessary gadgets away during class time.
2. Everyone should come prepared to class. Not everything will be in the lectures; thus, the recommended pre-lecture videos and readings are expected, if not required.
3. University rules on absence, cheating, dropping and LOA shall apply.
4. The instructors reserve the right to change class policies when deemed necessary.

Grading System

| 1.00 | 1.25 | 1.50 | 1.75 | 2.00 | 2.25 | 2.5 | 2.75 | 3.00 | 5.00 |
|----------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| [92,100] | [88,92) | [84,88) | [80,84) | [76,80) | [72,76) | [68,72) | [64,68) | [60,64) | [0,60) |

List of Instructors

| | |
|--------------------------------------|-------------------------------|
| Dr. Terence Tumolva | Prof. Karl Ezra Pilario |
| Dr. Maria Lourdes Dalida | Prof. Charlimagne Montealegre |
| Prof. Jonas Karl Christopher Agutaya | Engr. Michael Sean Deang |
| Prof. Kristian July Yap | Engr. Marlon Mopon, Jr. |
| Prof. Jhud Mikhail Aberilla | |

References

1. Darton, R.C., et al., (eds.) (2003) *Chemical Engineering: Visions of the World*. Elsevier B.V., Amsterdam, the Netherlands.
2. Ogawa, K. (2007) *Chemical Engineering – A New Perspective*. Elsevier B.V., Amsterdam, the Netherlands.
3. Felder, R.M. and Rousseau, R.W. (2005) *Elementary Principles of Chemical Processes*, 3rd Ed. John Wiley & Sons, Inc., New Jersey.
4. Jose, W.I. (2011) *Introductory Concepts in Chemical Engineering*.
5. Basta, N. (1997) *Shreve's Chemical Process Industries*, 6th Ed. McGraw-Hill Publishing Company Inc., USA.
6. Olaño, S., et al. (2006) *Chemical Engineering Law Primer*. Merriam and Webster, Manila.