

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

1. Teaching Institution	University of Diyala - College of Engineering
2. University Department/Centre	Chemical Engineering Department
3. Course title/code	Principles of chemical engineering III – Ch. E.206
4. Modes of Attendance offered	Online studying (Electronic Teaching)
5. Semester/Year	1 st Semester/Academic Year 2020 – 2021
6. Number of hours tuition (total)	45 hrs (3 hrs per week)
7. Date of production/revision of this specification	12/6/2021
8. Aims of the Course	Learn the basics of energy balance in the development of industrial and energy formulas and their transformations in with and without chemical reaction.

9. Learning Outcomes, Teaching ,Learning and Assessment Method

A- Knowledge and Understanding

1. Definition the basics of energy and their transformation.
2. Types of Energy.
3. Energy balance.
4. Enthalpy-concentration charts and their uses.
5. Knowing how to balance unsteady material and energy systems.
6. Using Humidity charts.

B- Subject-specific skills

1. Solve problems for real gas and their mixture.
2. Using diagrams and chart for calculation Humidity and heat of solution.
3. Used unsteady state balances for solving systems.

C- Thinking Skills

1. Learning the basic calculation and principles in chemical engineering.
2. Using mathematical methods for solving material and energy balances.
3. Solving unsteady state models.

D- General and Transferable Skills (other skills relevant to employability and personal development)

1. Activity with society.
2. The work with a team.
3. How engineering is benefit for society and environment.

Teaching and Learning Methods

1. Lectures
2. Presenting Power point (PPT) slides
3. Problems discussion (Tutorial)

Assessment methods

1. Daily exams
2. Monthly exams
3. Home work
4. Final exams

10. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3	Introduction	1. Energy definition. 2. Energy forms.	1.Lectures (PPT) 2. Tutorial	Oral exam
2	3	Enthalpy	1. Latent heat of vaporization. 2. Enthalpy of reaction.	1.Lectures (PPT) 2. Tutorial	Oral exam
3	3	First law of thermodynamic	Energy balance without chemical reaction.	1.Lectures (PPT) 2. Tutorial	Oral exam Quiz
4	3	First law of thermodynamic	Energy balance with chemical reaction.	1.Lectures (PPT) 2. Tutorial	Oral exam Monthly exam
5	3	Energy balance	Application of energy balance in the industry.	1.Lectures (PPT) 2. Tutorial	Oral exam
6	3	Energy balance	Mechanical energy balance.	1.Lectures (PPT) 2. Tutorial	Oral exam Quiz
7	3	Heat of solution	Heat of solution	1.Lectures (PPT) 2. Tutorial	Oral exam
8	3	Humidity	1. Definitions of different kinds of humidity. 2. Humidity charts and their uses.	1.Lectures (PPT) 2. Tutorial	Oral exam Quiz
9	3	Heat capacity	Heat capacity	1.Lectures (PPT) 2. Tutorial	Oral exam Monthly exam
10	3	Enthalpy	Enthalpy-concentration charts and their uses	1.Lectures (PPT) 2. Tutorial	Oral exam
11	3	Degree of freedom	Degree of freedom of systems	1.Lectures (PPT) 2. Tutorial	Oral exam Quiz
12	3	Material and energy balance	Material and energy balance for complete projects.	1.Lectures (PPT) 2. Tutorial	Oral exam

13	3	Material and energy balance	Material and energy balance for complete projects.	1.Lectures (PPT) 2. Tutorial	Oral exam Quiz
14	3	Unsteady State energy balance	Unsteady state material balance	1.Lectures (PPT) 2. Tutorial	Oral exam
15	3	Unsteady State energy balance	Unsteady State energy balance	1.Lectures (PPT) 2. Tutorial	Oral exam Monthly exam

11. Infrastructure

Required reading:

1. Himmelblau David M. "Basic Principles and Calculations in Chemical Engineering". 7th Ed. 2003. Prentice Hall PTR.
2. Felder Richard M., Rousseau Ronald W. "Elementary Principles of Chemical Processes" 3rd Ed. 2001. John Willey & Sons.
3. Reklaitis G.V., Schneider Daniel R. "Introduction to Material and Energy Balances" 1983. John Wiley & Sons.
4. Hougen Olaf A., Watson Kenneth M. "Chemical Processes Principles". 2004, John Wiley and Sons & CBS Publishers.

Others

Lecture notes

Students answers for problems

Special requirements (include for example workshops, periodicals, IT software, websites)

Internet knowledge for chemical engineering

Community-based facilities (include for example, guest Lectures , internship , field studies)

Internship, field studies

12. The development of the curriculum plan