KING SAUD UNIVERSITY
COLLEGE OF ENGINEERING
CHEMICAL ENGINEERING DEPARTMENT

COURSE SPECIFICATION

According to the requirements of
The National Commission for Academic Accreditation & Assessment

CHE 201
Chemical Engineering Principles - I

Course Specification

Institution	KSU
College/Department	Engineering/Chemical

A Course Identification and General Information

1. Course title and code: CHE201: Chemical Engineering Principles 1
2. Credit hours 3
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **CHE**
4. Name of faculty member responsible for the course Ahmed Abasaeed and Mohammad Abashar
5. Level/year at which this course is offered 3ed level/2ed year
6. Pre-requisites for this course (if any) CHEM101
7. Co-requisites for this course (if any) None
8. Location if not on main campus

B Objectives

1. Summary of the main learning outcomes for students enrolled in the course. Familiarize the students with basic concepts and procedures to perform material balances on single, multiple units for both non-reactive and reactive processes
2. Briefly describe any plans for developing and improving the course that are being implemented. (eg increased use of IT or web based reference material, changes in content as a result of new research in the field) • Periodically revising the course content • Periodically update the course assignments

C. Course Description (Note: General description in the form to be used for the Bulletin or Handbook should be attached)

1 Topics to be Covered

List of Topics	No of Weeks	Contact hours
1. Origin of Chemical Engineering and role of Chemical Engineer	1	3
2. Introduction to Engineering Calculations (Units, dimensions and basic definitions. Conversion of units. Dimensional homogeneity and dimensionless quantities. Mathematical tools and problem solving techniques).	2.5	8
3. Processes and process variables (Mass, volume, temperature, pressure, flow rate, chemical composition)	2.5	8
4. Material balances (Application of principles of mathematics, physics and chemistry in material balances in single unit, multiple inputs/outputs, multiple units, recycle, bypass, purging in non-reactive and reactive processes, combustion reactions)	8.5	26

2 Course components (total contact hours per semester):

Lecture: 3	Tutorial: 1	Laboratory 0	Practical/Field work/Internship	Other:

3. Additional private study/learning hours expected for students per week. (This should be an average :for the semester not a specific requirement in each week)

4. Development of Learning Outcomes in Domains of Learning

For each of the domains of learning shown below indicate:

- A brief summary of the knowledge or skill the course is intended to develop;
- A description of the teaching strategies to be used in the course to develop that knowledge or skill;
- The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.

a. Knowledge

(i) Description of the knowledge to be acquired

- Understand the role of Chemical Engineers and the difference between Chemical Engineers and chemists
- Define and determine properties of process streams including fluid density, flow rate, chemical composition (mass and mole fractions, concentrations), fluid pressure, and temperature
- Able to perform material balances on single and multiple units with recycle and by-pass for nonreactive processes.
- Able to perform material balances on single and multiple units with recycle and by-pass for reactive processes
- Able to perform combustion reaction's calculations

(ii) Teaching strategies to be used to develop that knowledge

Course lectures

Solving numerous Examples both in classes and tutorial sessions.

(iii) Methods of assessment of knowledge acquired

Homework, Exams

b. Cognitive Skills

(i) Description of cognitive skills to be developed

- Able to convert quantities from one set of units to another quickly and accurately
- Able to represent and interpret process data

• Able to draw and label process flowcharts from verbal process descriptions
(ii) Teaching strategies to be used to develop these cognitive skills In class Examples In class discussion
(iii) Methods of assessment of students cognitive skills Homeworks, Quizes, Exams
c. Interpersonal Skills and Responsibility
(i) Description of the interpersonal skills and capacity to carry responsibility to be developed Attending classes on time Submitting homework on time
(ii) Teaching strategies to be used to develop these skills and abilities No students are allowed to enter the class room after 10 minutes of the class beginning No delayed homework submission is accepted
(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility
d. Communication, Information Technology and Numerical Skills
(i) Description of the skills to be developed in this domain.
(ii) Teaching strategies to be used to develop these skills
(iii) Methods of assessment of students numerical and communication skills
e. Psychomotor Skills (if applicable)

(i) Description of the psychomotor skills to be developed and the level of performance required
(ii) Teaching strategies to be used to develop these skills
(iii) Methods of assessment of students psychomotor skills

5. Schedule of Assessment Tasks for Students During the Semester

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Homework		10%
2	Exam I		20%
3	Exam II		20%
4	Final Exam		50%

D. Student Support

1. Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Office Hours (10 per week)

E Learning Resources

1. Required Text(s)

Felder R. M. and Rousseau, R. W. "Elementary Principles of Chemical Processes" John Wiley & Sons, 3rd ed.

2. Essential References

3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)

4-.Electronic Materials, Web Sites etc

5- Other learning material such as computer-based programs/CD, professional standards/regulations

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)
1. Accommodation (Lecture rooms, laboratories, etc.) Spacious lecture room equipped with blackboard and relaxed seats
2. Computing resources
3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching Student evaluation of instructor at the conclusion of the course
2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department Student survey to assess the level of outcome achievement Faculty survey to assess the level of outcome achievement
3 Processes for Improvement of Teaching • Evaluation of the student and faculty survey • Writing a course performance report that discusses weaknesses if found and suggests action for improvement
4. Processes for Verifying Standards of Student Achievement (eg. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. Collecting sample of the student graded homework, quizzes and exams in a course portfolio for further inspection, evaluation and monitoring student progress, Direct assessment of course specific outcomes though embedded questions in midterm and/or final exams.