TEMPLATE FOR COURSE SPECIFICATION

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 programme specification.

1. Teaching Institution	University of Technology
2. University Department/Centre	Chemical Engineering Department
3. Course title/code	Equipment Design CE 341
4. Programme(s) to which it contributes	
5. Modes of Attendance offered	Fall
6. Semester/Year	2 semester/year
7. Number of hours tuition (total)	3
8. Date of production/revision of this Specification	5-5-2014
9. Aims of the Course	
1. To prepare students to be able to read and understand chemical engineering plants drawing	
2. The student should have the necessary skills to design equipments such vessels ,gas-liquid separator …..etc by Provide practice to design	
3. To be a part of working group , cooperate together to use the knowledge gained to get a proper design	
4- To be able to use computer software packages to perform design activity beside the conventional methods	

10· Learning Outcomes, Teaching ,Learning and Assessment Method

A- Knowledge and Understanding

A1. The anatomy of chemical engineering plants

A2. The main symbols used in chemical plants drawings

A3.. The equation related to design different equipments

A4.using computer software to accomplish design activity

B. Subject-specific skills

B1 **Steps to equipment design and obtain experiences**

B2..**The manners and mentality for group work**

B3.. . **Gathering required data from different refrences to start work**

Teaching and Learning Methods

Lectures, Tutorials , Example Classes , formal teamwork , Weekly homework problems

Assessment methods

Midterm exams , Final exam , Quizzes, Weekly homework, Team and homework problems , partial test (Oral questions :,alternative response), Open questions that have a definite answer ,

C. Thinking Skills

C1

C2.

C3..

C4.

Teaching and Learning Methods

Lectures, Tutorials , Example Classes , Informal and formal teamwork , Weekly homework problems , **student seminar** , Practical Applications

Assessment methods

Midterm exams , Final exam , Quizzes, Weekly homework, Team and homework problems , partial test (Oral questions :-,alternative response),

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

D1. Work together in same-discipline teams to solve engineering problems.
D2. To review state-of-the-art concepts for process intensification and design approaches used for such reactors.
D3. Speed intuitive, predictability and evaluate information and ideas in the handling of chemical reactor issues

11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment M
1st semester					
1	3	To understand the nature of chemical design structure and the anatomy of chemical process	Nature of design ,the organization of a chemical engineering projects	Lectures, Tutorials , Example Classes , Practical Applications	partial test (Oral questions,alternative response),
2	3	Types of flow sheet use in chemical engineering drawing and Equipment symbols	Flow sheet design	Lectures, Tutorials , Example Classes	
3	3	To get thr knowledge for preparing PFD and P&I D diagrams	flow sheet types	Lectures, Tutorials , Example Classes	
4	3	The effective factors consider in site layout and plant layout selection	Site layout Project evaluation and cost estimation	Lectures, Example Classes	
5	3	Pipe sizing , pipe fittings and valves types ,and the specifications of pumps and compressors	Piping system. , Pumps, and compressors	Lectures, Example Classes	
6	3	Vessels types and the specification difference	Vessels design	Lectures, Tutorials , Example Classes	
7	3	Design equations utilized and data sheet preparation	Vessels design	Lectures, Tutorials , Example Classes	
8	3	Basic principal of solid handling systems and factors influencing on each system	Solid Handling ..	Lectures, Example Classes	
9	3	Explain the main equipments used in size reduction and supplementary systems	Size reduction	Lectures, Example Classes	

10	3	Basic design procedure	Heat Transfer Equipments.	Lectures, Tutorials , Example Classes	
11	3	Explain the different type of heat transfer equipments specification	Heat Transfer Equipments	Lectures, Tutorials , Example Classes	
12	3	Explain the different type of heat transfer equipments specification	Heat Transfer Equipments	Lectures, Tutorials , Example Classes	
13	3	Basic knowledge of gas-liquid contact equipments	Mass Transfer Equipments	Lectures, Tutorials , Example Classes	
14	3	The characterization and specification of gas-liquid contact equipments	Mass Transfer Equipments	Lectures, Tutorials , Example Classes	
15	3	The characterization and specification of gas-liquid contact equipments	Mass Transfer Equipments	Lectures, Tutorials , Example Classes	
2nd semester					
16	5	Explain design procedure for vessels design by example + the concepts of simulation	Pressure vessels design + computer aided design Laboratory (Introduction to simulation principle)	Lectures, Tutorials , Example Classes ,	
17	5	prepare data sheets for vessels + tha ability to utilize computer software HYSYS	Pressure vessels design and pumps+ computer aided design Laboratory (getting start to computer software HYSYS)	Lectures, Tutorials , Example Classes , Practical Applications	
18	5	Connection of piping and pumps to the vessels + the knowledge of HYSYS functions	Pressure vessels design + computer aided design Laboratory	Lectures, Tutorials , Example Classes ,	
19	5	Ability to design gas-liquid seperator and prepare dara sheet + practice design for compressor and separator with HYSYS	gas-liquid separator, manually + computer aided design Laboratory (+ simulation of compressor and separator)	Lectures, Tutorials , Example Classes ,	
20	5	Ability to design liquid - liquid seperator and prepare dara sheet + +practice design for compressor and separator with HYSYS	liquid-liquid separator + computer aided design Laboratory (simulation of compressor and separator)	Lectures, , Example Classes ,	

21	5	Basic design procedure and theories related to design + practice desigm for reactor with HYSYS	Heat transfer practice + computer aided design Laboratory	Lectures, , Example Classes , Practical Applications	
22	5	Ability to utilize books and referances to obtain the required physical properties of their approach system (heat capacity …etc + practice desigm for reactor with HYSYS	Heat transfer practice + computer aided design Laboratory	Lectures, , Example Classes , Practical Applications	
23	5	Calculate Overall heat transfer coefficient.and area required for heat exchanger design + practice desigm for reactor	Heat transfer practice + computer aided design Laboratory	Lectures, , Example Classes , Practical Applications	
24	5	The ability to calculate individual heat transfer coefficients and pressure drop for heat exchangers	Heat transfer practice + computer aided design Laboratory	Lectures, , , Practical Applications	
25	5	The student had been applied all steps required to design heat exchanger equipments	Heat transfer practice + computer aided design Laboratory	,Practical Applications	
26	5	Understand the main concept of tower or column in chemical engineering equipment and the differences between tray and packed column	Mass transfer practice + computer aided design Laboratory	Lectures, , Example Classes , Practical Applications	
27	5	Ability to utilize books and referances to obtain the required physical properties of their approach system X-Y diagram	Mass transfer practice + computer aided design Laboratory	Lectures, Tutorials , , Practical Applications	
28	5	Practices the the necessary steps for towers internal design	Mas transfer practice + computer aided design Laboratory	Lectures, Tutorials , , Practical Applications	
29	5	Practices the the necessary steps for towers internal design	Mass transfer practice + computer aided design Laboratory	Lectures, Tutorials , Practical Applications	
30	5	The student had been applied all steps required to design distillation column	Mass transfer practice + computer aided design Laboratory	, Example Classes , Practical Applications	

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	o Lecturers o Book "H. Scott Fogler, Elements of Chemical Reaction Engineering, 4th Edition (International Edition), Prentice Hall, 2006." o Other support books :- G.F. Froment and K.B. Bischoff, Chemical Reactor Analysis and Design (3nd edit), John Wiley & Sons 2011 L D Schmidt, The Engineering of Chemical Reactions (2nd Edition), OUP, 2005. O. Levenspiel, Chemical Reaction Engineering (3rd edition), John Wiley & Sons 1999
Special requirements (include for example workshops, periodicals, IT software, websites)	websites
Community-based facilities (include for example, guest Lectures , internship , field studies)	field trips, pilot plant laboratory ,Summer training

13. Admissions	
Pre-requisites	Before undertaking this module the student should have undertaken the following: Basic Principles of chemical engineering I and II , , mathematics I and II ,Physical chemistry,Thermodynamics,Heat transfer,Mass transfer, Fluid flow , Strength of materials , and Computer programs
Minimum number of students	Non
Maximum number of students	Non