STUDY PLAN
Master in Chemical Engineering
(Thesis Track)

Plan No.			2005	T

I. GENERAL RULES CONDITIONS:

1. This plan conforms to the regulations of the general frame of the programs in graduate studies.
2. Areas of specialty of admission in this program:
   - Holders of the Bachelor's degree in:
   a. Chemical Engineering.
   b. Mechanical Engineering.
   c. Process Engineering.
   d. Other Holders of the Bachelor's degrees in Engineering disciplines closely related to Chemical Engineering .

II. SPECIAL CONDITIONS: None.

III. THE STUDY PLAN: Studying (33) Credit Hours as follows:

1- Obligatory courses: (18) Credit Hours:

Course no	Course name	Credit	Theory	Prac.	Pre-request
0905721	Thermodynamics	3	3	-	-
0905722	Chemical Reaction Engineering	3	3	-	-
0905732	Mathematical Methods in Chemical Engineering.	3	3	-	-
0905741	Transport Phenomena	3	3	-	-
0905742	Mass Transfer	3	3	-	0905741
0905761	Computer-Aided Design	3	3	-	-

2. Elective Courses: Studying (6) Credit Hours from the following:

Course no	Course name	Credit	Ther	Prac.	Pre-request
0905731	Numerical Analysis	3	3	-	-
0905744	Process Heat Transfer	3	3	-	0905741
0905745	Interfacial Processes	3	3	-	-
0905755	Biochemical Engineering	3	3	-	-
0905773	Process Control	3	3	-	-
0905774	Particulate Technology	3	3	-	-
0905781	Special Topics in Chemical Engineering	3	3	-	-

3. Thesis (9) credit hours (0905799).

الخطة الدراسية المعتمدة

STUDY PLAN
Master in Chemical Engineering
(None Thesis Track)

Plan No.		2005	N

IV. GENERAL RULES CONDITIONS:

3. This plan conforms to the regulations of the general frame of the programs in graduate studies.
4. Areas of specialty of admission in this program:
   - Holders of the Bachelor's degree in:
   a. Chemical Engineering.
   b. Mechanical Engineering.
   c. Process Engineering.
   d. Other Holders of the Bachelor's degrees in Engineering disciplines closely related to Chemical Engineering.

VI. SPECIAL CONDITIONS: None.

VII. THE STUDY PLAN: Studying (33) Credit Hours as follows:

a. Obligatory courses: (24) Credit Hours:

Course no	Course name	Credit	Theory	Prac.	Pre-request
0905721	Thermodynamics	3	3	-	-
0905722	Chemical Reaction Engineering	3	3	-	-
0905731	Numerical Analysis	3	3	-	-
0905732	Mathematical Methods in Chemical Engineering.	3	3	-	-
0905741	Transport Phenomena	3	3	-	-
0905742	Mass Transfer	3	3	-	0905741
0905744	Process Heat Transfer	3	3	-	0905741
0905761	Computer-Aided Design	3	3	-	-

2. Elective Courses: Studying (9) Credit Hours from the following:

Course no	Course name	Credit	Theory	Prac.	Pre-request
0905745	Interfacial Processes	3	3	-	-
0905755	Biochemical Engineering	3	3	-	-
0905773	Process Control	3	3	-	-
0905774	Particulate Technology	3	3	-	-
0905781	Special Topics in Chemical Engineering	3	3	-	-

3. A comprehensive exam (0905797).

الخطة الدراسية المعتمدة

COURSE DESCRIPTION

(0905721) THERMODYNAMICS

Review of classical thermodynamics, phase and chemical equilibria for binary and multicomponent systems. Prediction, correlation, testing and representation of equilibrium data for binary and multicomponent mixtures. Prediction of thermodynamics properties from molecular partition functions.

(0905722) CHEMICAL REACTION ENGINEERING

The course includes the application of basic concepts of chemical kinetics, thermodynamics and transport phenomena to the analysis, design and operation of homogeneous, noncatalytic and catalytic heterogeneous chemical reactors. Macro- and micro-mixing effects and modeling; stability; design and simulation of reactors.

(0905731) NUMERICAL ANALYSIS

This course deals with the application of numerical techniques to chemical engineering calculations with emphasis on computer methods. Topics include interpolation, integration, solution of ordinary and partial differential equations, aspects of numerical optimization methods and practices in simulation of simple chemical engineering units and processes.

(0905732) MATHEMATICAL METHODS IN CHEMICAL ENGINEERING

Mathematical formulation of typical chemical engineering problems in terms of ordinary and partial differential equations, matrices and vectors. Solution by mathematical methods employing Laplace, Fourier transformations, special functions, approximate methods, and other techniques.

(0905741) TRANSPORT PHENOMENA

This course includes an introduction to transport phenomena, molecular transport mechanisms, shell balances with applications on one dimensional transport, general balance relations (equations of change) for momentum, heat and mass transfer, general methods of solving P.D.E. with applications on transport processes, integral method of analysis (boundary layer theory) for momentum, heat and mass transfer convective transport, turbulent transport.

(0905742) MASS TRANSFER

This course includes an introduction, ordinary diffusion with applications, conservation equations with application, different kinds of diffusion, concentration distributions with more than one independent variables, different methods used to solve it, convective mass transfer models with applications, mass transfer with chemical reactions, simultaneous heat and mass transfer, multicomponent diffusion, diffusion and flow in porous media, interphase mass transfer, mass transfer with high mass transfer rates, mass transfer in turbulent flow.

(0905744) PROCESS HEAT TRANSFER

Steady and unsteady states conduction in multiple dimensions. Boundary layer convection and two- phase flow models. Selection and thermal design of heat exchangers in chemical plants. Radiation heat transfer and fired furnace models. Heat transfer in agitated and jacketed vessels and coils. Optimum design, size and cost of heat transfer equipment.

(0905745) INTERFACIAL PROCESSES

Physical chemistry of surfaces. Theory of adsorption at gas, liquid and solid interfaces: Thermodynamic and kinetic analysis. Colloidal suspensions: Formation, properties and destabilization. Flocculation kinetics. Transport across membranes with applications.

(0905755) BIOCHEMICAL ENGINEERING

Introduction. Theory and applications of enzymatic reactions. Mixed culture systems. Analysis, design and instrumentation of batch and continuous bioreactors. Product separation and purification. Mass transfer in biological systems. Industrial fermentation and environmental applications.

(0905761) COMPUTER-AIDED DESIGN

This course includes a review of process optimization, computer aided design of continuous and non-continuous chemical processes, strategies for process flow sheeting computations, algorithms for partitioning, design variable selection and tearing, sparse matrix computations and data storage, design and scheduling of batch chemical processes, process chemical synthesis of heat integration and individual projects using available process simulators .

(0905773) PROCESS CONTROL

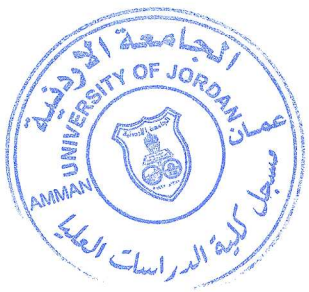
This course includes a review of stability analysis, control systems with large dead time, multi loop control systems, multivariable control systems, process identification, adaptive control and modern control applications.

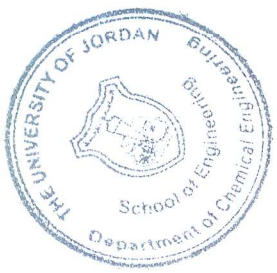
(0905774) PARTICULATE THECHNOLOGY

This course includes characterization of individual particle and solid particles, fundamentals of particulate solids flow and handling including mechanisms of solid enlargement, agglomeration, compaction and mixing, design and applications of pneumatic conveyor, design and scale-up of fluidized bed systems and spouted beds, suspension of solids, flotation circuits and flocculator design, filtration design and applications, in addition to the concepts of bubbles, drops and droplets.

(0905781) SPECIAL TOPICS IN CHEMICAL ENGINEERING

This course is offered in a special topic such as: Plastics manufacture engineering, Pollution control, Industrial hazards.





الخطة الدراسية المعتمدة