



## Annual Course Report

Program on which this course is given:	Diploma of Applications of Automatic Control of Mech. Power Systems
Department offering the program:	Mechanical Power Engineering Department - ACC control Lab
Department offering the course:	Mechanical Power Engineering Department - ACC control Lab
Academic Level:	Elective Course- 1 <sup>st</sup> or 2 <sup>nd</sup> Term of the Diploma of Graduate Studies
Date	1 <sup>st</sup> Term 2014/2015
Semester (based on final exam timing)	√ Fall                      √ Spring

### A - Basic Information

1. Title:	<b>Heat and Mass Transfer</b>						Code:	<b>MEP 590</b>
2. Units/Credit hrs per week:	Lectures	3 Credit hours per week	Tutorial	--	Practical	--	Total	3
3. Names of lecturers contributing to the delivery of the course: Associate Professor Assistance Professor Dr. Amro Abdel-Raouf								
4. Course coordinator:	Associate Professor Dr. Mohsen S. Soliman	External evaluator:	NA at this time					

### B- Statistical Information (for 2014/2015)

See the Next Tables for all Grades and statistics for the last term and the one before it

جامعة القاهرة - كلية الهندسة												
قسم هندسة القوى الميكانيكية												
نتيجة الفصل الدراسي الأول للعام الأكاديمي 2014/2015												
دبلوم تطبيقات التحكم الأوتوماتيكي في نظم القوى - طلاب تم تسجيلهم حسب اللائحة الجديدة 2015												
رقم الطالب	(مق 560) أجهزة القياس والاختبارات والتحكم في نظم القوى الميكانيكية	(مق 561) التحكم الأتوماتيكي - النظرية والتطبيق في نظم القوى الميكانيكية	(مق 562) استخدام الدوائر الهيدروليكية في نظم التحكم الأتوماتيكي	(مق 571) تطبيقات المعامل الافتراضية في التحكم في أنظمة تكييف الهواء المركزية	(مق 590) انتقال الحرارة والكتلة	الدراسية	عدد الفصول المكتسبة	إجمالي الساعات	مجموع النقاط الكلية	المعدل التراكمي	التقدير	الحالة
1	-A	A	A		+B	1	12	45	3.8	-A	مستمر	
2	-B	B	+B		C	1	12	33	2.8	-B	مستمر	
3	A	A	+A	+C		1	12	43	3.6	+B	مستمر	
4	B	+B	-A	B		1	12	39	3.3	+B	مستمر	
5	B	B	B		-B	1	12	35	2.9	-B	مستمر	
6	+C	+C	-A		F	1	9	28	2.3	+C	مستمر	
7	+B	+B	-A		+C	1	12	39	3.3	+B	مستمر	
8	+B	+B	-B			1	9	28	3.1	B	مستمر	
9	A	A	A			1	9	36	4	+A	مستمر	
10	-A	-A	-A		F	1	9	33	2.8	-B	مستمر	
11	-A	B	B		-B	1	12	37	3.1	B	مستمر	
12	-A	-A	A	C		1	12	40	3.4	+B	مستمر	
13	+B	+B	A		+C	1	12	39	3.2	B	مستمر	
14	C	-B	C			1	9	20	2.2	C	مستمر	
15	A	A	+B		D	1	9	37	3.1	B	مستمر	
16	+C	+C	-A	B		1	12	37	3.1	B	مستمر	
17	+C	+C	-A	+A		1	12	38	3.2	B	مستمر	
18	A	A	+A	+B		1	12	46	3.8	-A	مستمر	
19	-A	A	+B		B	1	12	42	3.5	+B	مستمر	
20	-A	-B	-A		+C	1	9	26	2.9	-B	مستمر	
21	-A	A	+B	B		1	12	42	3.5	+B	مستمر	



قسم هندسة القوى الميكانيكية - كلية الهندسة - جامعة القاهرة -

دبلوم تطبيقات التحكم الأوتوماتيكي في نظم القوى الميكانيكية

نتيجة الفصل الدراسي الثاني للعام الأكاديمي 2013 / 2014 (حسب اللائحة القديمة)

رقم الطالب	مق 590 انتقال الحرارة والكتلة	مق 579 تطبيقات خطوط الأنابيب الصناعية	مق 566 تطبيقات متقدمة للدوائر الهيدروليكية في نظم التحكم الأوتوماتيكي	مق 564 استخدام PLC وتكنولوجيا المعلومات في نظم التحكم الآلي	مق 563 استخدام المعامل الافتراضية في تحليل نظم التحكم الأوتوماتيكي	الدراسية	إدارة الفصل	الساعات	مجموع النقاط	التراكمي	المعدل	التقدير	المالية
1	C	B+	A	B	B	2	24	72.9	3	B	B	مستمر	
2	C	B	B	B	B-	2	24	61.2	2.6	C+	C+	مستمر	
3		A-	A	A-	B+	2	24	86.1	3.6	B+	B+	مستمر	
4	----	----	----	----	----	2	12	34.2	----	----	----	غياب	
5		A-	B+	A-	B+	2	24	81.9	3.4	B+	B+	مستمر	
6		B+	A-	B	B	2	24	78.9	3.3	B+	B+	مستمر	
7	----	----	----	----	----	2	12	39.9	---	---	----	غياب	
8	----	A-	A	B	B	2	24	76.2	3.2	B	B	مستمر	
9	----	B+	B+	B+	B+	2	24	73.2	3	B	B	مستمر	
10	C+	B+	----	B+	B	1	12	35.7	3	B	B	مستمر	
11	A-	A-	----	A-	A-	1	12	44.4	3.7	A-	A-	مستمر	
12	C	B	----	B+	B	1	12	33.9	2.8	B-	B-	مستمر	
13	----	----	----	A-	A	1	6	23.1	3.9	A-	A-	مستمر	

### C- Professional Information

#### 1. Course Teaching:

• Topics actually taught	No. of hrs	Lecture	Tutorial/ Practical	Lecturer
Introduction to Heat and Mass Transfer processes in many important applications of mechanical power systems. Important concepts of Heat and Mass transfer and thermo-fluid processes in practical automatic control systems. Various definitions, basics, and conservation equations of different types of applications of Heat and Mass Transfer processes. Relation between heat transfer processes and thermodynamic processes. Different modes of heat transfer and their physical origin. Analysis and examination of steady 1-D conduction, uniform & non-uniform thermal conductivity, heat sources & extended surfaces. Analysis and examination of Transient 1-D conduction covering: lumped capacitance method and Heizer charts. Analysis and examination of Different free convection processes and problems involving horizontal cylinders, horizontal plates, spheres, vertical walls and vertical cylinders. Analysis and examination of Different forced convection problems involving flow across single cylinder, flow across single sphere, flow across tube banks & internal flow through tubes. Investigation & analysis of multi-mode heat transfer problems and basic types and performance of various heat exchangers. Practical examples for Heat and Mass Transfer systems and processes.	36 hrs	3 hrs/ week for 12 weeks before the final term exam	---	Associate Professor Dr. Mohsen S. Soliman & Assistance Professor Dr. Amro Abdel-Rauf
• Topics taught as a percentage of the content specified:	<input type="checkbox"/> >90%	<input checked="" type="checkbox"/> 70-90%	<input type="checkbox"/> <70%	
• Reasons in detail for not teaching any topic:				
- Reducing the number of weeks/ Semester for many social and political reasons.				
- Many mandatory vacations as per requirements of the university management. The term is only 12 weeks.				



• If any topics were taught which are not specified, give reasons in detail: Non

**2. Teaching and Learning Methods:**

Lectures (√)	Practical/ Training ( )	Seminar/ Workshop ( )	Class Activity (√)	Case Study (√)	Projects ( )	Laboratory ( )	E-learning (√)	Assignments /Homework (√)	Other: Submitting reports
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If teaching and learning methods were used other than those specified, list and give reasons: Non

**3. Student Assessment:**

• Method of Assessment	Percentage of total
-All in-term works, sheets, and Reports	30%
-Final-term formal, written Examination	70%
-Total	100%

• Members of Examination Committee: Associate Professor Dr. Mohsen S. Soliman & Assistance Professor Dr. Amro Abdel-Raouf

• Role of external evaluator: Review program ILOs

**4. Facilities and Teaching Materials:**  Totally adequate  Adequate to some extent  Inadequate

List any inadequacies:  
Classes are not totally suits the Multi-Media Facilities  
Classroom has no white screen for the data show and it needs more ventilation fans.

**5. Exams/ILOs Matrix**

• ILOs/Evaluation Source Matrix

ILOs	Source of Evaluation									
	Assignments	Quizzes	Experiments	Lab Exam	Midterm Exam	Projects	Term Papers/Reports	Final Exam	Others 1	Others 2
<ul style="list-style-type: none"> <li>❖ Knowledge and Understanding</li> <li>❖ Intellectual Skills</li> <li>❖ Professional and Practical Skills</li> <li>❖ General and Transferable Skills</li> </ul>										
<p><b>a) Knowledge and Understanding:</b> Having successfully completed this course, the post-graduate student should have knowledge and understanding of:</p> <ul style="list-style-type: none"> <li>- Basics, various definitions &amp; terminologies associated with Heat and Mass Transfer processes.</li> <li>- Relation between heat transfer processes and thermodynamic processes.</li> <li>- Different modes of heat transfer and their physical origin.</li> <li>- Steady 1-D conduction, uniform and non-uniform thermal conductivity, heat sources, and extended surfaces.</li> <li>- Transient 1-D conduction covering: lumped capacitance method and Heizer charts.</li> <li>- Different heat transfer processes involving free convection processes and problems involving horizontal cylinders, horizontal plates, spheres, vertical walls and vertical cylinders.</li> <li>- Different forced convection problems involving flow across single cylinder, flow across single sphere, flow across tube banks &amp; internal flow through tubes.</li> <li>- Multi-mode heat transfer problems and basic types and performance of heat exchangers.</li> </ul>	√	√	-	-	-	-	√	√	-	-



**b) Intellectual Skills:**

Having successfully completed this course, the student should have the ability to do:

- Select and apply appropriate technical and optimum method in doing engineering design and analysis of automatic control problems.
- Searching for scientific information & adopting self-learning capabilities.
- Analyze and compare the component effects, performance, and efficiency of different types of Heat and Mass Transfer systems.
- Compare between various types of Heat and Mass Transfer processes, components, and systems.
- Select and apply appropriate Heat and Mass Transfer processes, components to design, model, analyze, and solve automatic control problems.
- Apply scientific & engineering analysis for Heat & Mass Transfer systems.

√	√	-	-	-	-	√	√	-	-
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**c) Professional and Practical Skills:**

Having successfully completed this course, the student should have the ability to do:

- Identify several types of Heat and Mass Transfer control problems which are essential for design and operation of mechanical power systems and energy transfer processes.
- Perform professional design & modelling for different Heat & Mass Transfer control systems.
- Suggest possible alternative solutions for various types Heat and Mass Transfer components and parts.
- Diagnose efficiency and performance of different types of Heat and Mass Transfer systems.

√	√	-	-	-	-	√	√	-	-
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**d) General and Transferable Skills:**

Having successfully completed this course, the student should have the ability to do:

- Perform engineering assembly of different Heat and Mass Transfer processes & components in one control system.
- Transfer knowledge, Work in group and Communicate in written and oral forms, in English.
- Use IT & evolutionary technological tools & PC applications (Excel, Mat lab, Virtual labs, .etc).
- Prepare and write reports, Manipulate and sort data, Think logically, and continuous self-E-learning.
- Use computer software applications (Excel, EES, Mat lab, Auto CAD, ...etc).
- Identify practical problems, compare between different technologies for HVAC systems.
- Organise and manage time and resources effectively; for short-term and longer-term commitments.

√	√	-	-	-	-	√	√	-	-
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- Midterm Exam: No Midterm Exam for graduate studies programs

Question	ILOs									
	1	2	3	4	5	6	7	8	9	10
1. (problem 1)										
2. (problem 2)										

- Final Exam:



Different parts of the ILOs are evaluated adequately through-out various part of the final exam

Question	ILOs									
	1	2	3	4	5	6	7	8	9	10
1. (problem 1)	√	√	√							
2. (problem 2)			√	√	√					
3. (problem 3)					√	√	√	√		
4. (problem 4)							√	√	√	√
5. (problem 5)								√	√	√

<b>6. Administrative Constraints: Reducing the number of the weeks per semester</b>		
<ul style="list-style-type: none"> <li>List any difficulties encountered:           <ul style="list-style-type: none"> <li>- Reducing the number of weeks/ Semester for many social and political reasons</li> <li>- Many mandatory vacations as per requirements of the university management. The term is only 12 weeks.</li> </ul> </li> </ul>		
<b>7. Comments from external evaluator(s):</b>	<b>Response of Course Team</b>	
Not available in writing for instructors to respond to	None	
<b>8. Comments from Students:</b>	<b>Response of Course Team</b>	
Done but not available in writing for instructors to respond to	None	
<b>9. Course Enhancement:</b>		
<b>Progress on actions identified in the previous year's action plan:</b>		
<b>Action</b>	<b>State whether or not completed and give reasons for any non-completion</b>	
Upgrading Teaching facilities Supply visual aids for the classrooms Maintenance of classrooms	Not completed due to administrative problems	
<b>10. Action Plan for Academic Year 2014 – 2015</b>		
<b>Actions Required</b>	<b>Completion Date</b>	<b>Person Responsible</b>
Upgrading Teaching facilities Supply visual aids Maintenance of classrooms Incorporate more practical materials & measurement experimental labs in the course Make a Mat lab programs to illustrate the basic ideas of each topic with graphs	End of 2015	Administration and Members of The Examination Committee
<b>Course Coordinator:</b>	Associate Professor Dr. Mohsen S. Soliman	
<b>Signature:</b>		