



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:	Mandatory Course- 2 nd Term of the Diploma of Graduate Studies
Date	1 st Term 2014/2015
Semester (based on final exam timing)	<input type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring

A - Basic Information

1. Title:	Using Virtual Labs for Analysis of Automatic Control Systems					Code:	MEP 563	
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 Dr. Mohsen S. Soliman

4. Course coordinator:	Associate Professor Dr. Mohsen S. Soliman	External evaluator:	NA at this time
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B- Statistical Information (for 2013/2014)

See the Next Table for all Grades and statistics for the last spring-term 2013/2014

كلية الهندسة - جامعة القاهرة - قسم هندسة القوى الميكانيكية دبلوم تطبيقات التحكم الأوتوماتيكي في نظم القوى الميكانيكية نتيجة الفصل الدراسي الثاني للعام الأكاديمي 2013 /2014 (حسب الملائحة القديمة)											
رقم الطالب	مق 590	مق 579	مق 566	مق 564	مق 563	عدد الفصول الدراسية	إجمالي الساعات المكتسبة	إجمالي النقاط الكلية	مجموع النقاط المعمل التراكمي	التقدير	الحالة
	انتقال الحرارة والكتلة	تطبيقات خطوط الأنابيب الصناعية	تطبيقات متقدمة للدوائر الهيدروليكية في نظم التحكم الأوتوماتيكي	استخدام PLC وتكنولوجيا المعلومات في نظم التحكم الألى	استخدام المعامل الافتراضية في تحليل نظم التحكم الأتوماتيكي						
1	C	B+	A	B	B	2	24	72.9	3	B	مستمر
2	C	B	B	B	B-	2	24	61.2	2.6	C+	مستمر
3		A-	A	A-	B+	2	24	86.1	3.6	B+	مستمر
4	----	----	----	----	----	2	12	34.2	----	----	غياب
5		A-	B+	A-	B+	2	24	81.9	3.4	B+	مستمر
6		B+	A-	B	B	2	24	78.9	3.3	B+	مستمر
7	----	----	----	----	----	2	12	39.9	---	----	غياب
8	----	A-	A	B	B	2	24	76.2	3.2	B	مستمر
9	----	B+	B+	B+	B+	2	24	73.2	3	B+	مستمر
10	C+	B+	----	B+	B	1	12	35.7	3	B	مستمر
11	A-	A-	----	A-	A-	1	12	44.4	3.7	A-	مستمر
12	C	B	----	B+	B	1	12	33.9	2.8	B-	مستمر
13	----	----	----	A-	A	1	6	23.1	3.9	A-	مستمر

C- Professional Information

1. Course Teaching:

• Topics actually taught	No. of hrs	Lecture	Tutorial/ Practical	Lecturer
- Definition of Virtual Labs (V.L.), Relation with PC and IT applications - Function of V.L. in Automatic Control Systems of Mechanical Power Engineering- Requirements of on line interactive Control-Systematic	36 hrs	3 hrs/ week for 12	---	Associate Professor Dr.



Basic Components and general format for Automatic Control V.L.- Main Menus of V.L. program-Setting Basic Control Elements- Showing Flow directions on Synoptic diagram- Elements of Main Control Board- Sensors and Gauges Board- Operation, Control and Alarms Board- Changing Operation Parameters- Diagnostics and Trouble Shooting- Data Recording-File Saving-Operator Reports- Charts of Heat Balance & System thermal Results- Evaluation and Calibration of V.L. Program- Case Study: Management and Operation of Automatic Control System of Industrial Water Tube Boiler- The simulation includes many critical control alarms, input/output signals, operation and instrumentation parameter-boards, diagnostic tools, error-report filling, help/trouble- shooting menus and Thermal Balance Calculations and Plotting tools.	weeks before the final term exam	Mohsen S. Soliman
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• Topics taught as a percentage of the content specified:	<input checked="" 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

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:	<input type="checkbox"/> Totally adequate <input checked="" type="checkbox"/> Adequate to some extent <input type="checkbox"/> 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 ❖ Knowledge and Understanding ❖ Intellectual Skills ❖ Professional and Practical Skills ❖ General and Transferable Skills	Source of Evaluation									
	Assignments	Quizzes	Experiments	Lab Exam	Midterm Exam	Projects	Term Papers/Reports	Final Exam	Others 1	Others 2



<p>a) Knowledge and Understanding:</p> <ul style="list-style-type: none"> -Basics&definitions & terminologies of Virtual Lab teaching techniques. -Requirements of interactive virt.lab to study & analyze control systems. -Basics of mass, heat & energy transfer equipments and energy efficiency processes for safe-operation and stable control of water tube boiler. -Basics and essential components and various components and physical parts of various types of Fire-Tube Boilers and Water-Tube Boilers. -Various typesof control subsystems&sensors for operation of boilers. -Management of Water-tube Boiler parameters, synoptic diagram, flow paths, instrumentation, control Boards, operation buttons, alarm signals, system diagnostics, and diagnostic page of various output data. -Analysis of heat balance for heat transfer processes in water tube boilers. -Presentationof heat transfer processes in water tube boiler on H-S chart. -Concepts of verification and calibration of automatic control virtual lab. 	√	√	-	-	-	-	√	√	-	-
<p>b) Intellectual Skills:</p> <ul style="list-style-type: none"> -Select and apply appropriate technical and optimum method in doing engineering design and analysis of automatic control problems. -Searching for scientific information and adopting automatic control self-E-learning capabilities. -Analyze and compare component effects, performance, and efficiency of types of automatic control subsystems in industrial practical virtual lab. -Verify accuracy & validity of a virtual lab program by doing parallel engineering calculations. -Apply thermodynamic&energy balance analysis for Water-Tube Boiler. -Apply the concept of software simulation of diagnostics & operation of Water-Tube Boiler system. -Comparebetween measurement devices, transducers&methods for signal conditioning, data acquisition and different output displaying/processing systems of Water-Tube Boiler. -Solve exampleson mass, heat balance&efficiency for Water-Tube Boiler. -Study, describe, and compare between methods for measurement of pressure, temperature, flow rate, water-level,..etc for Water-Tube Boiler. 	√	√	-	-	-	-	√	√	-	-
<p>c) Professional and Practical Skills:</p> <ul style="list-style-type: none"> -Identify several types of sensors and automatic control subsystems which are essential for the safe and stable operation of various energy transfer processes of Water-Tube Boiler system. -Suggest possible alternative sensors and automatic control subsystems of Water-Tube Boiler. -Diagnose all possible operation modes, thermodynamic properties/conditions, heat balance and thermal efficiency of various parts and components of Water-Tube Boiler system. - Use, applyandcalibrate an on-line interactive automatic control Virtual Lab for Water-Tube Boiler. - Diagnose failure and automatic control problems of industrial Water-Tube Boiler. - Monitorandevaluate performanceofdifferent parts and components Water-Tube Boiler system. - Formulate and analyze heat transfer and flow problems related to Water-Tube Boiler system. -Performanalyseof manytypes of heat exchangers,thermal energy systems of Water-Tube Boiler. 	√	√	-	-	-	-	√	√	-	-



d) General and Transferable Skills:

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

- Transfer knowledge, Work in group, and Communicate in written and oral forms, in English.
- Use IT and evolutionary technological tools & PC applications (Excel, Mat lab, Virtual labs, .etc).
- Prepare & write reports, Manipulate and sort data, Think logically, and continuous self-E-learning.
- Identify practical problems, compare between different technologies for Water-Tube Boiler.
- Organise & manage time & 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)								√	√	√

6. Administrative Constraints: Reducing the number of the weeks per semester

- List any difficulties encountered:

- 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.

7. Comments from external evaluator(s):	Response of Course Team
Not available in writing for instructors to respond to	None
8. Comments from Students:	Response of Course Team
Done but not available in writing for instructors to respond to	None
9. Course Enhancement:	
Progress on actions identified in the previous year's action plan:	
Action	State whether or not completed and give reasons for any non-completion
Upgrading Teaching facilities Supply visual aids for the classrooms Maintenance of classrooms	Not completed due to administrative problems



10. Action Plan for Academic Year 2014 – 2015		
Actions Required	Completion Date	Person Responsible
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
Course Coordinator:	Associate Professor Dr. Mohsen S. Soliman	
Signature:		