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- 2nd Term of the Diploma of Graduate Studies**
Date	**2nd Term 2015/2016**
Semester (based on final exam timing)	☐ Fall √ 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

B- Statistical Information (for 2015/2016)

See the Next Table for all Grades and statistics for the last spring-term 2015/2016

جامعة القاهرة
كلية الهندسة

نتيجة الفصل الدراسى الثانى للعام الأكاديمى ٢٠١٥/٢٠١٦

تأهيلى ماجستير هندسة القوى الميكانيكية

قسم هندسة القوى الميكانيكية

الحالة	التقدير	المعدل التراكمى	مجموع النقاط الكلية	جمالى الساعات المكتسبة	عدد الفصول الدراسية	(مكر ٥٩٠ الحرارة والكتلة)	خطوط الأنابيب (مكر ٥٧٩)	(مكر ٥٧١) تطبيقات الصناعية	في التحكم في النظم (مكر ٥٧٠) المعامل الإفتراضية	PLC (مكر ٥٦٤) استخدام وتكنولوجيا	(مكر ٥٦٣ استخدام المعامل الإفتراضية في تحليل نظم التحكم)	(مكر ٥٦٥ استخدام الدوائر الهيدرونيكية في نظم التحكم)	اسم الطالب
مستمر	B	٣.٢	٣٨.١	١٢	٢					B			ابراهيم مصطفى محمد احمد
مستمر	-A	٣.٨	٤٥	١٢	٢		+B			A			حازم عبد العزيز محمد حسن النجار
مستمر	B	٣.١	٣٧.٢	٩	١	B				-A	-A	C	احمد علي العدل احمد
مستمر	B	٣.١	٣٧.٨	٩	١		+B			A	+B	C	احمد كمال احمد نديم
مستمر	-B	٢.٨	٣٣	٩	١		B			-A	B	+D	احمد مصطفى إبراهيم زغلول
مستمر	-B	٢.٧	٣١.٢	٦	١	-C				-A	+B	-C	شيماء حمزة عنبر
مستمر	+B	٣.٤	٤٠.٢	١٢	١		+B			-A	-A	-B	طارق سعيد محمد احمد النحاس
مستمر	+B	٣.٥	٢١	٦	١			B		A			كريم عبدالحميد ابوزيد محمد كيشار
مستمر	B	٣.١	٣٦.٩	٩	١	+B				-A	B	+C	محمد احمد محمد محمد عثمان
مستمر	-C	١.٩	٢٣.١	٦	١	+D				-B	-B	D	محمود محمد مرتضى السيد الجبري
مستمر	+B	٣	٣٩	٩	١		+B				A	-C	هبة السيد ابراهيم الغلبان

وكيل الكلية لشئون الدراسات العليا والبحوث   08/06/2016   رئيس لجنة الرصد

جامعة القاهرة
كلية الهندسة

نتيجة الفصل الدراسى الثانى للعام الأكاديمى ٢٠١٥/٢٠١٦

دبلوم تطبيقات التحكم الأوتوماتيكى فى نظم القوى الميكانيكية

قسم هندسة القوى الميكانيكية

الحالة	التقدير	المعدل التراكمى	مجموع النقاط الكلية	جمالى الساعات المكتسبة	عدد الفصول الدراسية	(مكر ٥٩٠ الحرارة والكتلة)	خطوط الأنابيب (مكر ٥٧٩)	(مكر ٥٧١) تطبيقات الصناعية	في التحكم في النظم (مكر ٥٧٠) المعامل الإفتراضية	PLC و تكنولوجيا استخدام (مكر ٥٦٤)	(مكر ٥٦٣ استخدام المعامل الإفتراضية في تحليل نظم التحكم)	(مكر ٥٦٥ استخدام الدوائر الهيدرونيكية في نظم التحكم)	(مكر ٥٩٩) المشروع	اسم الطالب
إعادة قيد ترم1	لم يحسب		٦٣	٢٦	٤	C				A	-A	C		دينا محمد عبد الناصر عبد الفتاح محمد
خريج	+B	٣.٤	١٠١	٣٠	٤				C					شريف حسن حافظ محمد حافظ
مستمر	+C	٢.٤	٧٠.٨	٢٧	٣				C				F	محمد إبراهيم بيومى إبراهيم
مستمر	+B	٣.٣	٦٠	١٨	٢	ع			-B	-A	-A			احمد شوقى سعيد عبد الشافى غزاله
مستمر	+B	٣.٦	٨٧.٣	٢٤	٢			-A		A	A			حسن محمود شهاوى الحنش
مستمر	+B	٣.٤	٧٢.٣	٢١	٢			B	B	-A	+B			شادي يوسف محمود قطب
مستمر	+B	٣.٣	٣٩.٩	١٢	٢					A	+C			عبدالرحمن عمرو عبدالمنعم حامد
مستمر	+B	٣.٥	٧٤.٤	٢١	٢			-A	-B	-A	+B			عمرو محمد محب عبدالحميد السنباطي
مستمر	+B	٣.٣	٦٨.٧	٢١	٢			B	-B	A	+B			مصطفى فؤاد حسين الوردانى
مستمر	B	٣	٥٤.٩	١٨	٢					+B	B			علاء الدين عادل محمد اسماعيل
مستمر	B	٣	٢٧	٩	١					-A	+B	C		اسحق ابراهيم زكي واصف
مستمر	+C	٢.٥	٢٧	٩	١			C		+B	B	-C		بلال عبدالعظيم أبوالمحاسن السيد سنجاب
مستمر	-B	٢.٩	٣٤.٢	١٢	١	C				-A	-A	C		جوليد عبدى احمد
مستمر	+B	٣.٥	٤٢	١٢	١	-A				A	+B	B		محمود نبيل عبد العزيز السيد هوله

وكيل الكلية لشئون الدراسات العليا والبحوث   08/06/2016   رئيس لجنة الرصد

-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 ـ   قسم هندسة القوى الميكانيكية

دبلوم تطبيقات التحكم الأوتوماتيكى فى نظم القوى الميكانيكية

نتيجة الفصل الدراسى الثانى للعام الأكاديمى 2013 /2014 (حسب اللائحة القديمة)

الحالة	التقدير	المعدل التراكمي	مجموع الكلية من النقاط	إجمالي الساعات	عدد المقررات الدراسية	مكق563 استخدام المعامل الافتراضية فى تحليل نظم التحكم الأتوماتيكى	مكق 564 استخدام PLC وتكنولوجيا المعلومات فى نظم التحكم الآلى	مكق 566 تطبيقات متقدمة للدوائر الهيدروليكيةفى نظم التحكم الأتوماتيكى	مكق 579 تطبيقات خطوط الأنابيب الصناعية	مكق 590 انتقال الحرارة والكتلة	رقم الطالب
مستمر	B	3	72.9	24	2	B	B	A	B+	C	1
مستمر	C+	2.6	61.2	24	2	B-	B	B	B	C	2
مستمر	B+	3.6	86.1	24	2	B+	A-	A	A-		3
غياب	----	----	34.2	12	2	----	----	----	----	----	4
مستمر	B+	3.4	81.9	24	2	B+	A-	B+	A-		5
مستمر	B+	3.3	78.9	24	2	B	B	A-	B+		6
غياب	---		39.9	12	2	----	----	----	----	----	7
مستمر	B	3.2	76.2	24	2	B	B	A	A-	----	8
مستمر	B	3	73.2	24	2	B+	B+	B+	B+	----	9
مستمر	B	3	35.7	12	1	B	B+	----	B+	C+	10
مستمر	A-	3.7	44.4	12	1	A-	A-	----	A-	A-	11
مستمر	B-	2.8	33.9	12	1	B	B+	----	B	C	12
مستمر	A-	3.9	23.1	6	1	A	A-	----	----	----	13

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 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.**	36 hrs	3 hrs/ week for 12 weeks before the final term exam	---	**Associate Professor Dr. Mohsen S. Soliman**

• **Topics taught as a percentage of the content specified:**	☐>90%	√ 70-90%	☐<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:	☐ **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 ❖ 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
a) Knowledge and Understanding: -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.	√	√	-	-	-	-	√	√	-	-

b) Intellectual Skills:

-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.

-Compare between measurement devices, transducers & methods for signal conditioning, data acquisition and different output displaying/processing systems of Water-Tube Boiler.

-Solve examples on 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.

√	√	-	-	-	-	√	√	-	-

c) Professional and Practical Skills:

-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, apply and calibrate an on-line interactive automatic control Virtual Lab for Water-Tube Boiler.

- Diagnose failure and automatic control problems of industrial Water-Tube Boiler.

- Monitor and evaluate performance of different parts and components Water-Tube Boiler system. - Formulate and analyze heat transfer and flow problems related to Water-Tube Boiler system.

-Perform analyse of many types 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.

√	√	-	-	-	-	√	√	-	-

- **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)								√	√	√

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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 2016 – 2017

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 2017**	**Administration and Members of The Examination Committee**
Course Coordinator:	**Associate Professor Dr. Mohsen S. Soliman**	
Signature:		

Date August 2016