



### Course Specifications

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- Last Term of the Diploma of Graduate Studies
Date	2 <sup>nd</sup> Term 2015/2016 or Summer Term 2016
Semester (based on final exam timing)	<input type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring <input checked="" type="checkbox"/> summer

#### A- Basic Information

1. Title:	<b>The diploma Design Project</b>						Code:	<b>MEP599</b>
2. Units/Credit hrs per week:	Lectures	3 Credit hours per week	Tutorial	--	Practical	--	Total	3

#### B- Professional Information

1. Course description:	<p><b>Overall Aims:</b> This is a special applied mandatory one course of the 6 mandatory courses requirements of the Diploma. Students take this course in the last term of the Diploma. The course is designed to verify the ILO's of the program and to prove that students understand various types of automatic control systems in mechanical power &amp; energy transfer processes. This course has neither term-work sheets, report assignments nor a written, formal final-term exam. All course grades are thus based upon the in-term project progress works, the project final oral presentation &amp; the project written technical report to be submitted before the oral presentation. Course overall aims is to test that the students will be capable to (depending on the project subject):</p> <ul style="list-style-type: none"> <li>-Apply &amp; use his technical skills and previously gained knowledge (in various automatic control fields/courses covered during the diploma) in order to perform a professional work to design, calculate, analyze, test, report, and present a practical &amp; applicable automatic control system.</li> <li>-To identify technological and automatic control problems of mechanical power systems and to suggest reasonable, efficient, most-economic, &amp; effective-optimum solutions for those problems.</li> <li>-To his use professional skills to select proper new technologies for various control applications.</li> <li>-To use self-E-learning and virtual lab programs and PC applications (Mat lab, AutoCAD, etc).</li> <li>-To organise &amp; manage time and all resources effectively; for short/long term commitments.</li> <li>-To manage work entitled, perform engineering calculations, transfer knowledge, communicate in written reports and oral forms in English, work in a group, manipulate and sort data, use of IT and evolutionary technological tools, and to think logically.</li> </ul>
	<p><b>2. Intended Learning Outcomes of Course (ILOs):</b></p> <p><b>a) Knowledge and Understanding:</b> Having successfully completed this course, the post-graduate student should have knowledge and understanding of (depending on the project subject):</p> <ul style="list-style-type: none"> <li>-Various types of automatic control systems in mechanical power &amp; energy transfer processes.</li> <li>-Basics, various definitions &amp; terminologies associated with automatic control systems.</li> <li>-Requirements of on-line interactive virtual lab programs to study and analyze control systems.</li> <li>-Essential components of control loops/circuits in many applications of mechanical power systems.</li> <li>-Conservation eqns. &amp; transfer functions of different types of automatic control systems/processes.</li> <li>-Basics &amp; requirements of performing a short-term project in different automatic control fields.</li> <li>-How to integrate various subjects, knowledge, understanding, &amp; skills into specific project task.</li> <li>-How to integrate human resources &amp; available materials into team project due at a specific time.</li> </ul> <p><b>b) Intellectual Skills:</b> Having successfully completed this course, the student should have the ability to do:</p> <ul style="list-style-type: none"> <li>-Select and apply appropriate technical and optimum method in doing engineering design and analysis of automatic control problems.</li> <li>-Searching for scientific information and adopting automatic control self-E-learning capabilities.</li> <li>-Analyze and compare the component effects, performance, and efficiency of different types of</li> </ul>



<p>automatic control systems.</p> <ul style="list-style-type: none"> <li>-Apply concepts of software simulation, diagnostics &amp; operation of various practical control systems.</li> <li>-Compare between various types of processes, components, &amp; complete control systems/circuits.</li> <li>-Apply scientific, engineering analysis, and appropriate modelling equation/process, &amp; to select best-efficient components to design, analyze, and solve automatic control problems.</li> </ul>
<p><b>c) Professional and Practical Skills:</b> Having successfully completed this course, the student should have the ability to do:</p> <ul style="list-style-type: none"> <li>-Identify several types of automatic control problems which are essential for design and operation of mechanical power systems and energy transfer processes.</li> <li>-Perform professional design and modelling for different automatic control systems.</li> <li>-Suggest possible alternative solutions for various types of components and parts.</li> <li>-Diagnose efficiency and performance of different types of control circuits/systems.</li> <li>- Analyze different types of processes on real psychometric diagram/plotting schematics.</li> </ul> <p><b>d) General and Transferable Skills:</b> Having successfully completed this course, the student should have the ability to do:</p> <ul style="list-style-type: none"> <li>- Perform engineering assembly of many processes &amp; components into 1-applicable control system.</li> <li>-Transfer knowledge, Work in group, &amp; Communicate in written &amp; oral forms, in English.</li> <li>- Use IT &amp; evolutionary technological tools &amp; PC applications (Excel, Mat lab, Virtual labs, .etc).</li> <li>- Prepare &amp; write reports, Manipulate &amp; sort data, Think logically, and continuous self-E-learning.</li> <li>- Identify practical problems, compare between different technologies for HVAC systems.</li> <li>-Organise &amp; manage time &amp; resources effectively; for short-term and longer-term commitments.</li> </ul>

**3. Contents**

Topics: They depend and will be different based on the subject of the project	Total hrs	Lectures hours	Tutorial/ Practical hrs
-This course has neither formal regular lectures nor term-work sheets, nor report assignments. Some lectures or other in-term activities may be done depending on the subject of the project.	45 hrs	--	---

**4. Teaching and Learning Methods: They depend and will be different based on the subject of the project**

Non-regular Lectures (√)	Practical/ Training (√)	Seminar/ Workshop (√)	Class Activity (√)	Case Study (√)	Project ( )	Laboratory ( )	E-learning (√)	Assignments /Homework ( )	Other: Submitting Final report
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**5. Student Assessment Methods**

Assessment Schedule	Week
This course has neither term-work sheets, report assignments nor a written, formal final-term exam. All course grades are based upon the various in-term project progress works, project final oral presentation and the project written technical report to be submitted before the oral presentation.	Week # 15 or # 16

**• Weighting of Assessments**

-All various in-term project progress works and the project written technical report to be submitted before the oral presentation.	50%
-Final-term written formal exam	--
- Final-term project oral presentation	50%
-Class Test	--
-Total	100%

**6. List of References: They depend and will be different based on the subject of the project.**

**7. Facilities Required for Teaching and Learning: Data Show & Laptop Computer for project presentations**

Course Coordinator:	Associate Professor Dr. Mohsen S. Soliman & Assistance Professor Dr. Amro Abdel-Raouf
Head of Department:	Professor Ashraf S. Sabery