



ديبلوم تطبيقات التحكم الأوتوماتيكي في نظم القوى الميكانيكية

MEP 567 Advanced Applications of PLC in Automatic Control Systems

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Mechanical Power Engineering Department

مق 567 "تطبيقات متقدمة لنظم وتكنولوجيا PLC" لابد من مراجعة وإستيعاب مقرر مق 564 الإجبارى قبل هذا المقرر

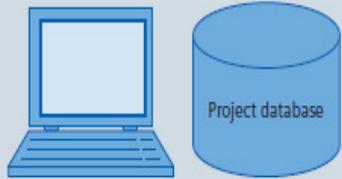
محتوى المقرر حسب اللائحة: تطبيقات وأمثلة نظرية وتطبيقية على إستخدامات أجهزة وحدات PLC فى دوائرالتحكم فى نظم هندسة القوى الميكانيكية – تطبيقات متنوعة وأمثلة على المخطط السلمى أو الدرجى Ladder Diagram – تطبيقات على الحاسب الآلى باستخدام برنامج فعليه للمحاكاة Simulators وبرامج تطبيقات PLCs على الحاسب الآلى.

MEP 567 - Advanced Applications of PLC in Automatic Control Systems:

Contents: Applications and Practical Examples for using PLC units in Automatic Control of Mechanical Power Systems- Various Examples and Applications for the Ladder Diagrams, Function Charts, and Statement Lists- Applications on PC using PLC simulation and Computer Programs.

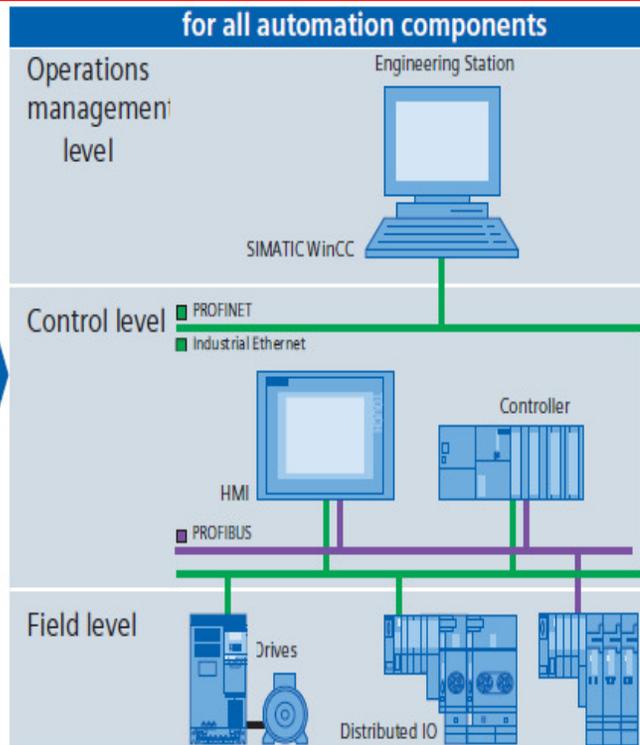
المقرر يضم عدد من الكتب والكتالوجات للتطبيقات والأمثلة المحلولة **Some Electronic/Digital References**

Standardized design
and engineering ...



- SIMATIC Automation Designer
- SIMATIC STEP 7
- SIMATIC WinCC / WinCC flexible

Engineering with SIMATIC –
The perfect basis for integrated
automation solutions across all levels



Course Description & Course ILO's Objectives

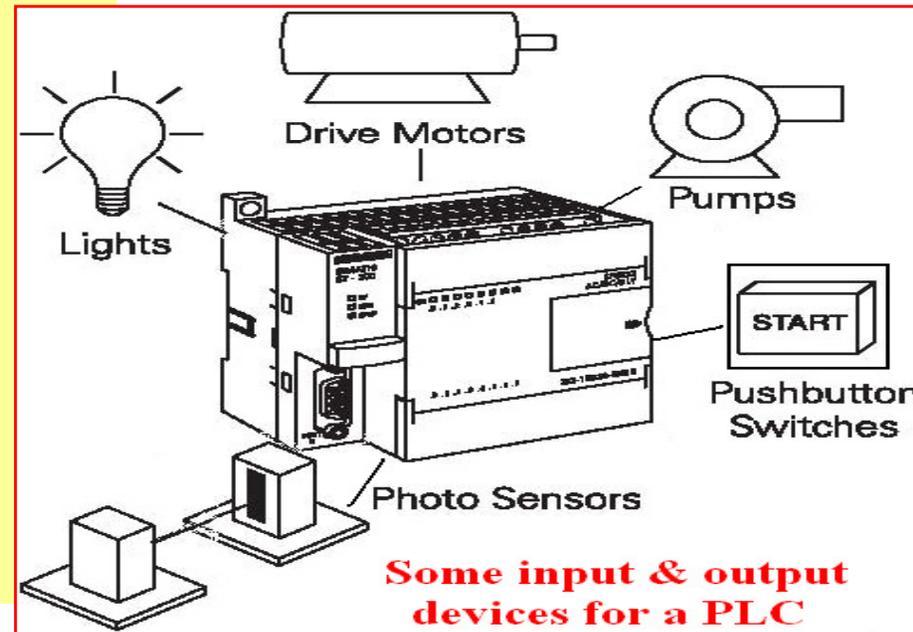
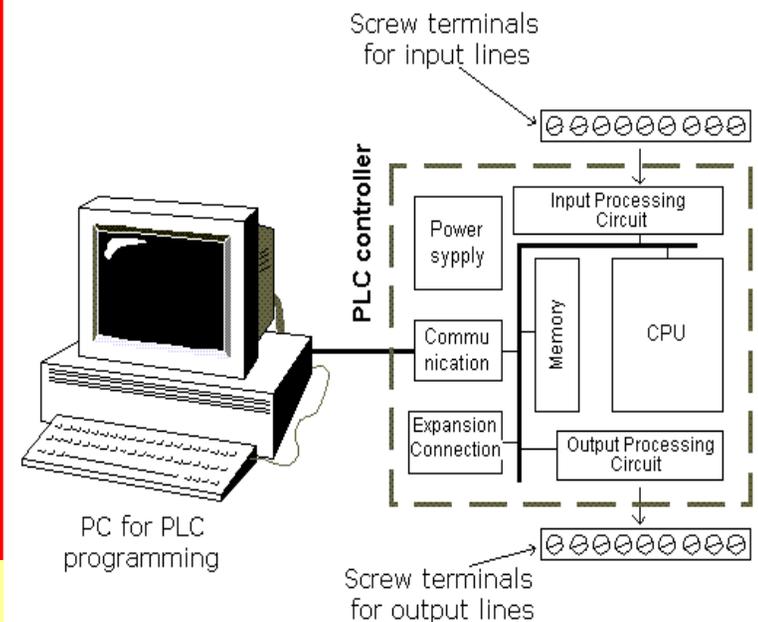
The course is designed to review, more effectively, all hardware & software components of many practical PLC systems. This is done by full understanding/deep examining actual & industrial PLC Systems. This course covers many applied & detailed examples for all working steps showing how to design, build, configure, program, test, trouble-shooting and finally to run a PLC project. These projects show typical LAD, FBD & STL programs to give the participants skills & knowledge to solve some practical and actual PLC examples & control projects.

ILO's : upon completion of course you should be able to:

- Identify terminology of Hardware & Accessories of PLCs.
- Identify types of discrete or analog I/O signals & modules.
- Identify operation/tech. differences between PLC devices.
- Select proper expansion module for analog/digital system
- Identify terminology of Software & Simulators for PLCs.
- Get proper ref./tech. manual for selection, programming, configuration and installation of PLC unit & accessories.
- Identify various parts of LAD, FBD, STL programs & Bls.
- Perform actual working & detailed steps to plan, design, install, build, configure, program, test, debug, trouble-shooting and finally to run a practical PLC project.

Purpose

- Most education focuses on continuous control systems & DCS systems
- In practice most contemporary control systems make use of computers.
- Computer based control is inherently different than continuous systems.
- The purpose of this course is to address discrete control systems using common control systems.
- The objective is to prepare the reader to implement a control system from beginning to end, including planning and design of hardware & software.



Some input & output devices for a PLC

How to use actual PLC Simulator Software (password: LadderBasic2009).

Organize ▾ Include in library ▾ Share with ▾ Burn New folder

★ Favorites

Desktop

Downloads

Recent Places

Libraries

Name

password.docx

SetupTL6Edu.exe

TL6ReferenceManual.pdf

Type

Microsoft Office ...

Application

Adobe Acrobat D...

Size

29 KB

5,517 KB

4,674 KB

Simulator Software & Its manual

PLC Simulator Software: **i-TRiLOGI Ladder+BASIC** Version 6.45

TL6ReferenceManual.pdf - Adobe Reader

File Edit View Window Help



1 / 321

101%

Tools

Sign

Comment



**TRIANGLE
RESEARCH
INTERNATIONAL**

i-TRiLOGI
Ladder+BASIC
Version 6.45

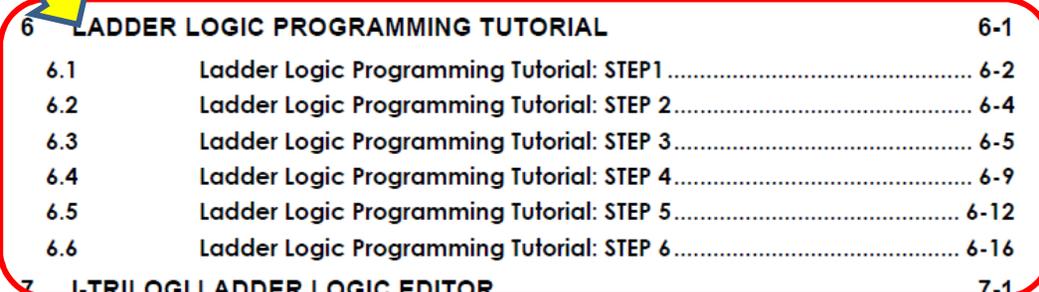
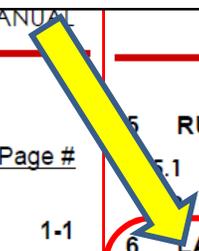
Revision 1.1

**Programmer's
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Course Specifications & Basic Information

1. Title:	Advanced Applications of PLC in automatic Control Systems			Code:MEP567
2. Credit hrs per week	Lectures= 3 hours per week	Tutorial= 0.0	Practical= 0.0	Total=3 Cr.Hrs

B- Professional Information

1. Course description: Overall Aims:

This advanced practical elective course is one of the 4 elective courses requirements of the Diploma. It is designed to review, more effectively, all Basic design Concepts and Fundamental Aspects of the hardware and software components of many practical PLC systems. This is done by full understanding and deep examining of actual & industrial PLC Systems. This course covers many applied and detailed examples for all working steps showing how to design, build, configure, program, test, trouble-shooting and finally to run a PLC project. These projects show typical LAD, FBD & STL programs to give the participants skills and knowledge to solve some practical and actual PLC examples and control projects.

Upon completion of course the students should be able to:

- Identify terminology of Hardware and Accessories of several types of industrial PLCs.
- Identify several types of discrete or analog Input/output signals and associated I/O modules.
- Identify operation and technical differences between PLC systems and expansion parts/devices.
- Select proper PLC expansion module for analog/digital system and special functions parts.
- Identify terminology of Software and Simulators for PLC automatic control systems.
- Get proper reference and technical manual for selection, programming, configuration and for installation of PLC unit and accessories.
- Identify various parts of PLC languishes for LAD, FBD, STL programs & Block functions.
- Perform actual working and detailed steps to plan, design, install, build, configure, program, test, debug, trouble-shooting and finally to run a practical PLC project.

2. Intended Learning Outcomes of Course (ILOs):

a) Knowledge and Understanding:

Having successfully completed this course, the post-graduate student should have knowledge and understanding of:

- Advanced hardware and software components of many practical and industrial PLC systems.
- Advanced applications and detailed examples for all working steps showing how to design, build, configure, program, test, trouble-shooting and finally to run a PLC project.
- Typical PLC design projects to show the LAD, FBD and STL programs and to give the students skills and knowledge to solve some practical and actual PLC examples and control projects.

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 and adopting automatic control self-E-learning capabilities.
- Analyze and compare the component effects, performance, and efficiency of different types of advanced PLC automatic control systems.
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- Analyze and compare the component effects, performance, and efficiency of different types of advanced PLC automatic control systems.
- Apply the concept of software simulation for analysis, diagnostics & operation of various types of advanced PLC automatic control systems.
- Compare between various types of advanced PLC components, and complete systems.

c) Professional and Practical Skills:

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

- Identify several types of automatic control problems using advanced PLC circuits/systems which are essential for the design and operation of mechanical power systems and energy transfer processes.
- Perform professional design and modelling for automatic control problems using advanced PLC circuits/systems
- Suggest possible alternative solutions for various types of components for automatic control problems using advanced PLC circuits/systems.
- Diagnose efficiency and performance of different types of advanced PLC automatic control circuits/systems.
- Analyze different types of automatic control problems using advanced PLC circuits/systems.

d) General and Transferable Skills:

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

- Perform engineering calculations, draw feed-back control circuits, block diagrams, graphical presentation of experimental data, and perform data-regression analysis.
- Transfer knowledge, Work in group, & Communicate in written & oral forms, in English.
- Use IT& evolutionary technological tools& PC applications (Excel, Mat lab, Virtual labs, .etc).
- Prepare & write reports, Manipulate & sort data, Think logically, and continuous self-E-learning.
- Identify practical problems, compare between different technologies for measurement systems.
- Organise & manage time & resources effectively; for short-term and longer-term commitments.