



Process Control and Building Management Systems

EME501

INSTRUCTOR

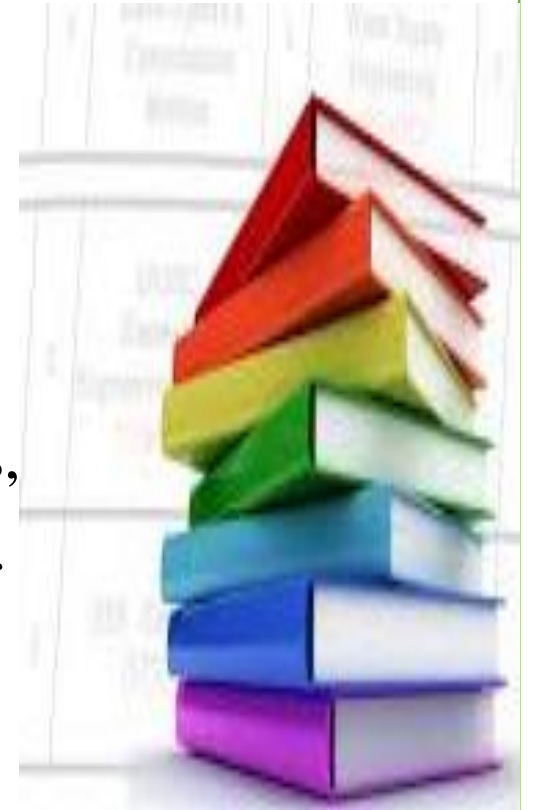
DR / AYMAN SOLIMAN

➤ Contents

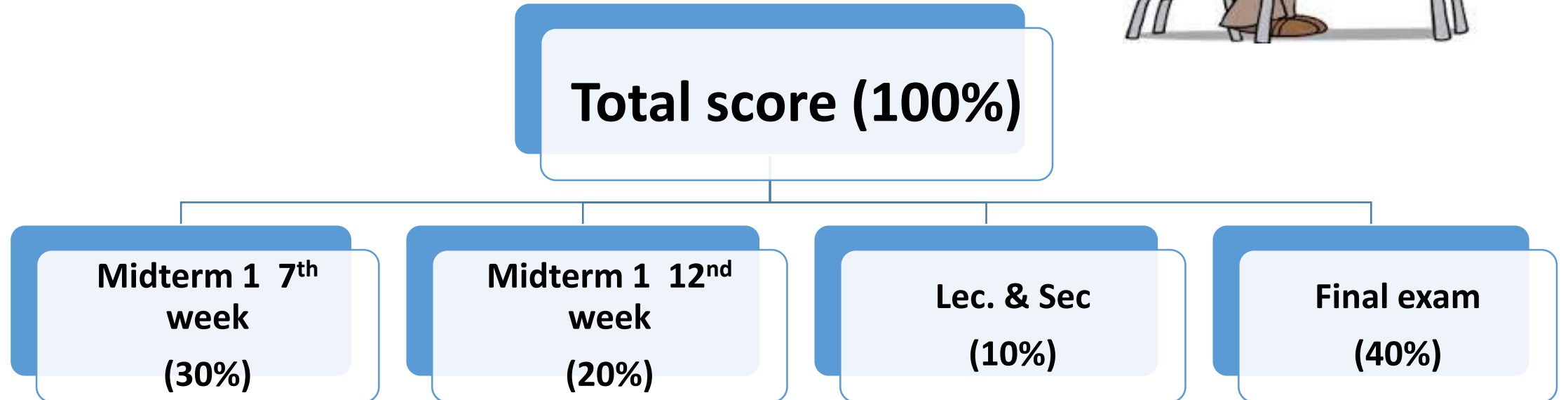
- 1) Course Contents.
- 2) Grading System & distribution.
- 3) Course Information.
- 4) Course Policy.
- 5) Objectives.
- 6) Introduction.

1) Course Contents.

- Lighting systems and powers systems.
- Computer automations including PLCs, SCADA.
- Design of PI, PD, PID controllers.
- Process control in air conditioning systems, Firefighting systems.
- Security and observation, Access control, Fire alarm system, Lifts, elevators etc., Plumbing, Closed-circuit television (CCTV), Other engineering systems, Control Panel, Alarm Monitor, Security Automation.



2) Grading System & distribution.



3) Course Information.

Lectures: Monday, Thursday → (9:00 - 10:05 AM)

Office Hours: Monday, Thursday → (10:10 AM - 14:00 PM)

Prerequisite: EME405 Automatic Control

References:

- Modern Control Engineering, by Katshuhiko Ogata Pearson; 5th edition, 2009.
- Lectures.

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TAs:

Eng. Fekry Awad

4) Course Policy.

- Any forms of **cheating or plagiarism** will result in a **Zero grade** for the required task, report or exam (No discussion nor excuses).
- Students are expected to **respect** Instructors, TAs, and their colleagues.
- Be **on time** and cell phones should be **silent** or **off** during the lecture.
- Your grades is based on **merit only** nothing else.



5) Objectives

- offers comprehensive solutions to complex industrial challenges.
- Optimizing plant operation to produce good quality products.
- Providing the first layer of protection against unsafe conditions.
- Controlling a process within preset operating conditions.
- Providing operator interface for monitoring & control HMI.
- Providing alarm/event logging and trending.
- Generating production data reports.



6) Introduction

- A building management system (**BMS**), otherwise known as a building automation system (**BAS**), is a computer-based control system installed in buildings that controls and monitors the building's mechanical and electrical equipment such as ventilation, lighting, power systems, fire systems, and security systems.
- A BMS consists of software and hardware; the software program, usually configured in a hierarchical manner, can be proprietary, using such protocols as C-Bus, Profibus, and so on.



6) Introduction (cont.)

- Building management systems are most commonly implemented in large projects with extensive mechanical, HVAC, and electrical systems.
- A list of systems that can be monitored or controlled by a BMS are shown below:

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- | | |
|--|--|
| <input type="checkbox"/> Illumination (lighting) control | <input type="checkbox"/> <u>Plumbing</u> |
| <input type="checkbox"/> Electric power control | <input type="checkbox"/> <u>Closed-circuit television (CCTV)</u> |
| <input type="checkbox"/> <u>Heating, ventilation, and air conditioning</u> | <input type="checkbox"/> Other engineering systems |
| <input type="checkbox"/> Security and observation | <input type="checkbox"/> Control Panel |
| <input type="checkbox"/> <u>Access control</u> | <input type="checkbox"/> Alarm Monitor |
| <input type="checkbox"/> <u>Fire alarm system</u> | <input type="checkbox"/> Security Automation |
| <input type="checkbox"/> <u>Lifts, elevators</u> etc | |
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6) Introduction (cont.)

- **Many benefits exist when a BMS is installed in a building, some of them are:**
 - ❑ Possibility of individual room control
 - ❑ Effective monitoring and targeting of energy consumption
 - ❑ Improved plant reliability and life
 - ❑ Save time and money during the maintenance
 - ❑ Lighting controls reduce unnecessary artificial lighting via motion sensors and schedules as well as by controlling daylight harvesting louvers
 - ❑ Controllers save water and energy by controlling rainwater harvesting and landscape irrigation

Thank

you

