

This file has been cleaned of potential threats.

To view the reconstructed contents, please SCROLL DOWN to next page.

---

# ELECTIVE 2 OPTIMAL CONTROL SYSTEMS (ACE 326)

Dr. Lamiaa M. Elshenawy

Email: [lamiaa.elshenawy@el-eng.menofia.edu.eg](mailto:lamiaa.elshenawy@el-eng.menofia.edu.eg)  
[lamiaa.elshenawy@gmail.com](mailto:lamiaa.elshenawy@gmail.com)

Website: [http://mu.menofia.edu.eg/lmyaa\\_alshnawy/StaffDetails/1/ar](http://mu.menofia.edu.eg/lmyaa_alshnawy/StaffDetails/1/ar)

# Course Syllabus

---

- ❑ Introduction to Optimization Theory
- ❑ Optimum Design
- ❑ Optimal Control

# What is Optimization?

---



# Why is Optimization?

---

Design an optimum can, i.e.,

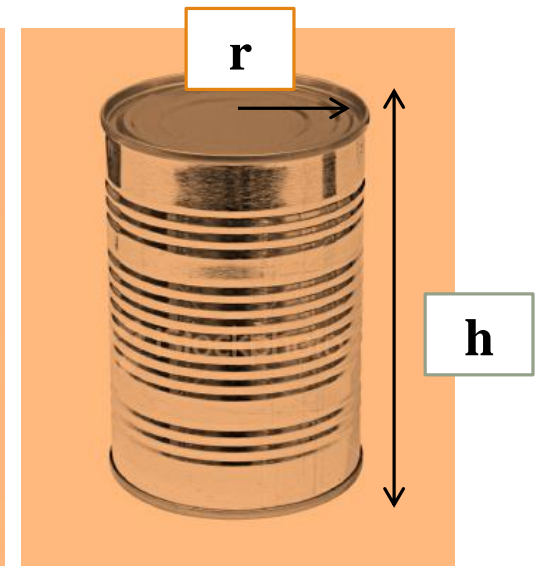
$$V=200 \text{ ml}$$

Cost minimum

$$3 \text{ cm} \leq r \leq 5 \text{ cm}$$

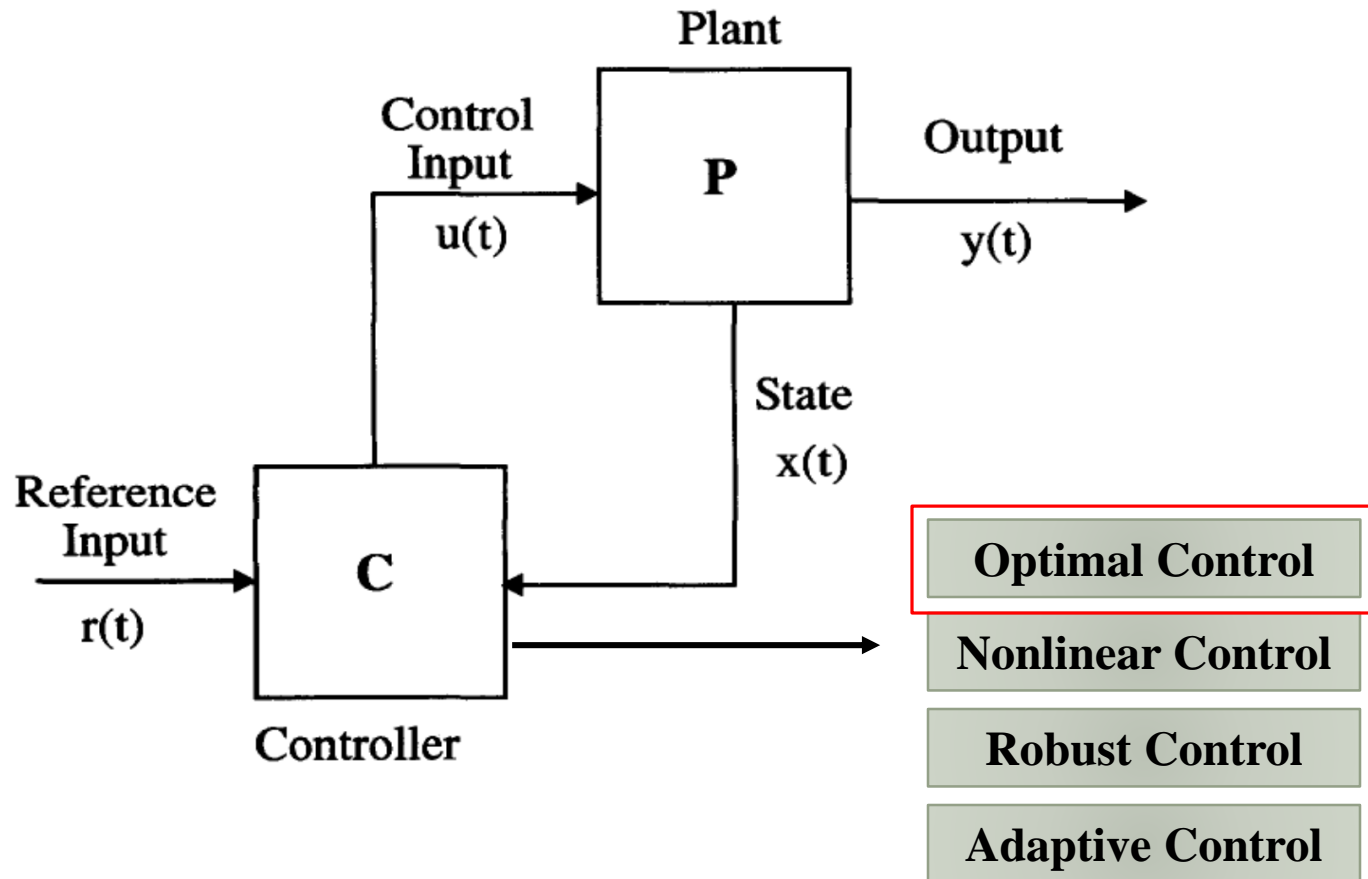
$$5 \text{ cm} \leq h \leq 22 \text{ cm}$$

$$h \geq 3r$$



# Modern Control Configuration

---



# What Background Required?

---

- 1. Linear Algebra(vector & matrix algebra)**
- 2. Basic Calculus (differential calculus & integral calculus)**
- 3. State Space Analysis**

# Resources

---

## □ Textbooks:



1. JASBIR S. ARORA. *Introduction to Optimum Design*. Elsevier, 2012.
2. D. Subbaram Naidu. *Optimal Control Systems*. CRC PRESS, 2003.

## □ Other References

1. <https://www.youtube.com/watch?v=LL20TZGXp3Q&list=PLbMVogVj5nJQNzJT6sYZpB7H1G6WF0FZ4>
2. <http://apmonitor.com/me575/index.php/Main/BookChapters>



# Timetable



Task	Week	Proportion
Quiz 1	5th	5 Marks
Midterm Exam	7th	15 Marks
Quiz 2	9th	5 Marks
Project	13th	5 Marks
Final Exam	16-18th	70 Marks
<b>Total</b>		<b>100 Marks</b>