VICTORIA UNIVERSITY OF WELLINGTON
TE HERENGA WAKA

Introduction to Course

XMUT315 Control Systems Engineering

What is XMUT315?

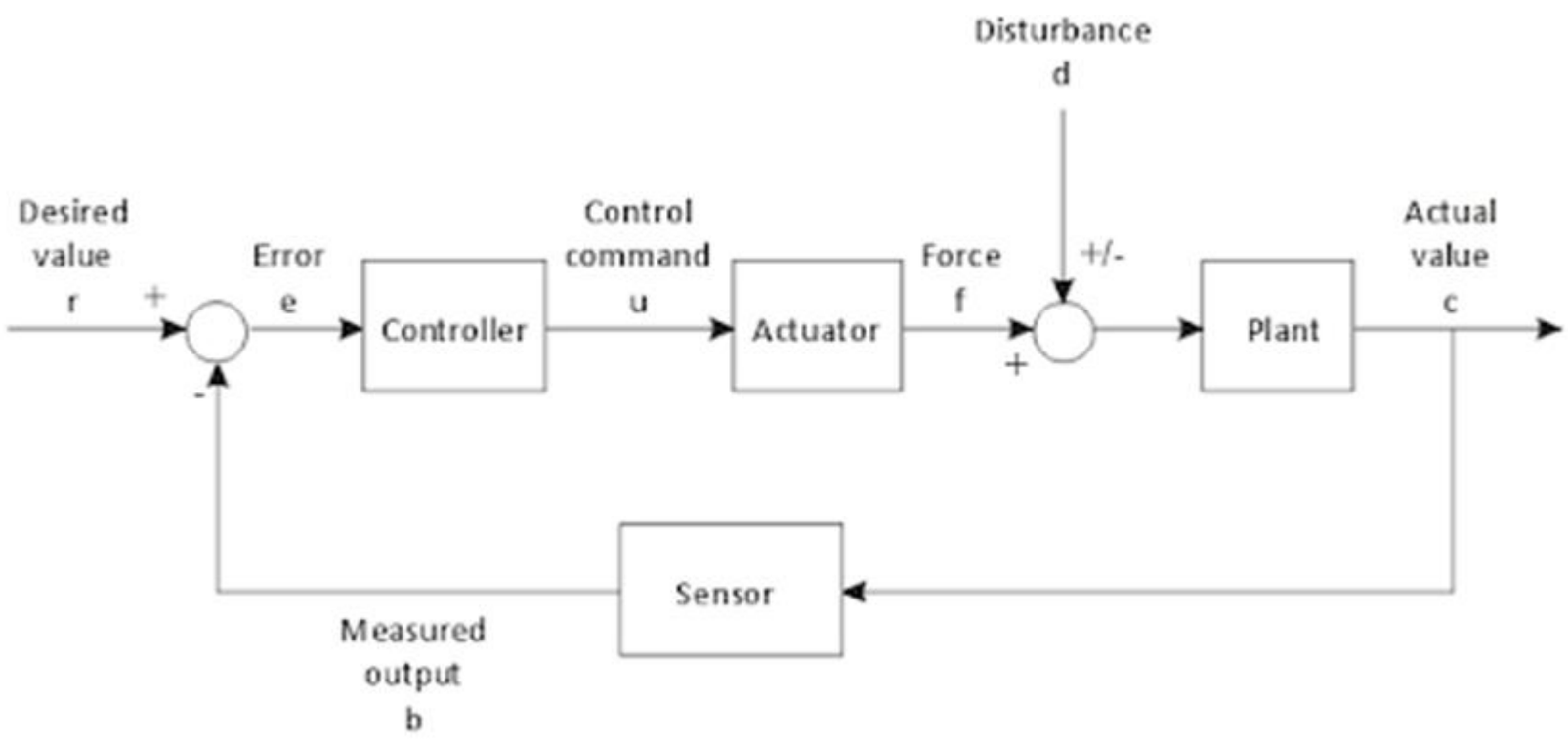
- Classical control systems knowledge and skills.
- Analysis, design and improvement/ modification of control systems.
- Analysis and design to solve (real-world) problems.

Topics in the Course

- Laplace transform.
- Modelling physical systems.
- Block manipulation of complex systems.
- Feedback and control system.
- Stability analysis.
- Time domain analysis.
- Steady state analysis.

Topics in the Course

- Controllers/compensators.
- Analytical, graphical and simulation techniques.
- Analysis and design of control systems.



Lectures

Lecture 1: System modelling.

Lecture 2: Feedback control system.

Lecture 3: Stability analysis.

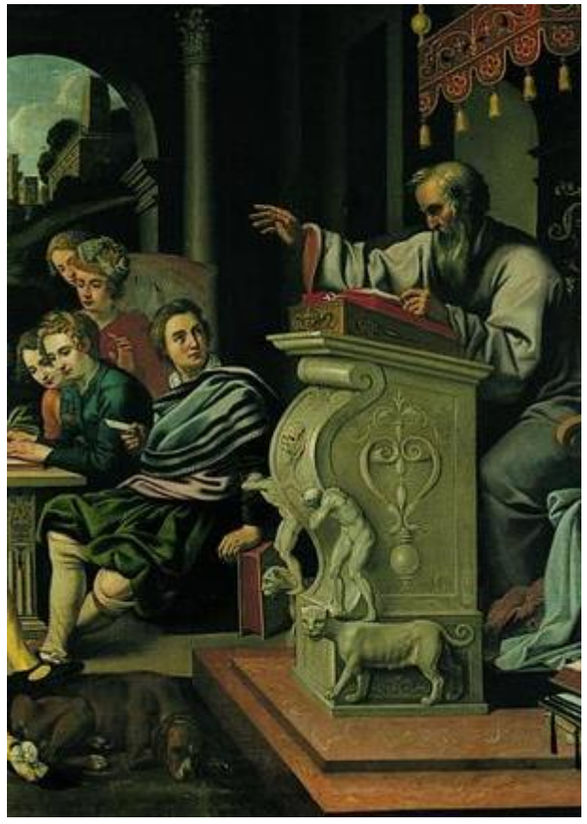
Lecture 4: Time domain analysis.

Lecture 5: Controllers/compensators.

Lecture 6: Frequency domain analysis.

Lecture 7: Root locus analysis.

Lecture 8: Design of control systems.



Tutorials

Tutorial 1: System modelling.

Tutorial 2: Feedback control system.

Tutorial 3: Stability analysis.

Tutorial 4: Time domain analysis.

Tutorial 5: Controllers/compensators.

Tutorial 6: Frequency domain analysis.

Tutorial 7: Root locus analysis.

Tutorial 8: Design of control systems.

Demos

Demo 1: System modelling.

Demo 2: Feedback control system.

Demo 3: Stability analysis.

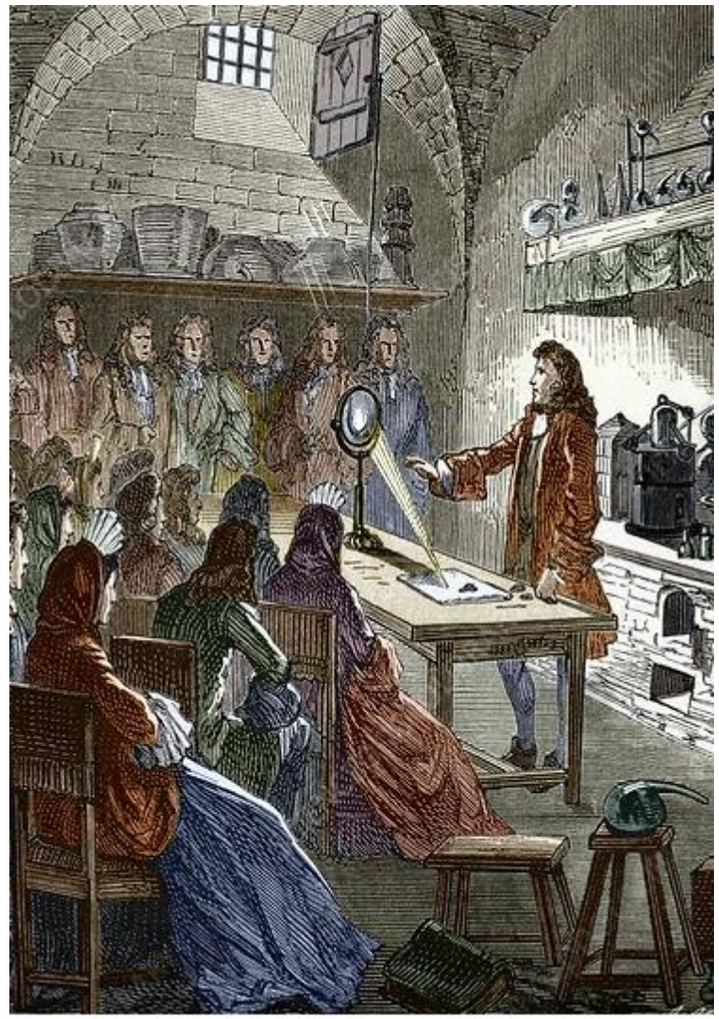
Demo 4: Time domain analysis.

Demo 5: Controllers/compensators.

Demo 6: Frequency domain analysis.

Demo 7: Root locus analysis.

Demo 8: Design of control systems.



Laboratories

Lab 1: System modelling and feedback control system.

Lab 2: Stability and time domain analysis.

Lab 3: Frequency domain analysis.

Lab 4: Root locus analysis.

Assignments

Assignment 1: System modelling and feedback control system

Assignment 2: Stability and time domain analysis

Assignment 3: Frequency domain analysis

Assignment 4: Root locus analysis

Assessment

- 4 Homework Assignments: 20% (each weighted equally).
- 2 Laboratories: 10% (each weighted equally).
- Mid-term Test (2 hours, 4 long answer questions): 20%.
- Final Exam (2 hours, 4 long answer questions): 40%.
- Attendance and Active Participations: 10%

Text Books

Recommended Textbook:

- Norman S. Nise, Control Systems Engineering (any edition is fine).

Other Textbooks:

- Katsuhiko Ogata, Modern Control Systems.
- Farid Golnaraghi & Benjamin Kuo, Automatic Control Systems.
- Richard C. Dorf & Robert H. Bishop, Modern Control Systems.

Class Representative (Monitor)

APPOINT A CLASS REP

Become a Student Representative at Victoria!

Class Reps are expected to liaise with the course coordinator, lecturer, and the class to support and improve students' learning experiences in your course and at Victoria

You will be trained and supported in your role by the VUWSA Education Team

Representing your class has many benefits; VicPlus points, Class Rep certificates, professional and personal growth, links to other representation opportunities

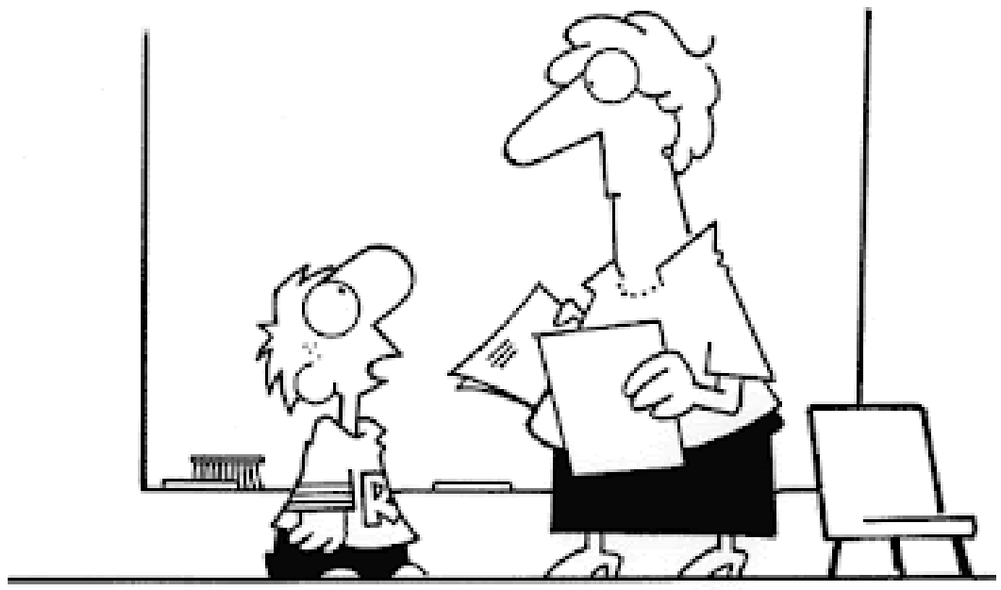
VUWSA
YOUR STUDENTS' ASSOCIATION

TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI
VICTORIA
UNIVERSITY OF WELLINGTON

Class Representative (Monitor)

Extensions, Penalties & Plagiarism

- Extensions seldom work.
- Late work will be penalised.
- Work more than one week late will not be marked.



"I couldn't do my homework because my computer has a virus and so do all my pencils and pens."

Extensions, Penalties & Plagiarism

- Measurements (“numbers”) can be shared with a lab partner – should always be acknowledged.
- Analysis & descriptions (“words”) should always be your own work.
- Official process exists for plagiarists. Not pleasant.

Course Communication

- Course website (lectures, notes, handouts, etc.):

  http://ecs.victoria.ac.nz/Courses/XMUT315_2024T1/

- Course group WeChat.

- Class Representative (Monitor).

Master of Engineering Practice

- Apply your technical knowledge to designing, implementing and evaluating practical engineering problems e.g. mechatronics, renewable energy, software engineering, electronics and networked applications.
- Develop teamwork and professional practice skills in the context of engineering problem solving—in a variety of industry relevant individual and group projects.
- Gain valuable research and communication skills through summarising research, writing engineering proposals, and delivering oral and written reports.
- https://www.wgtn.ac.nz/explore/postgraduate-programmes/master-of-engineering-practice/overview

Master of Computer Science

- Gain specialist knowledge of computer science theories, methods and strategy, and build on your skills in computing architecture, construction, engineering and design.
- Examine networks, software, tools and packages, and learn more about a range of programming languages and computer-based systems.
- Study emerging technology and explore concepts that will form the foundations of future innovations.
- https://www.wgtn.ac.nz/explore/postgraduate-programmes/master-of-computer-science/overview

Master of Software Development

- Learn how to program in Java, an object-oriented programming language used for large, enterprise-class applications.
- Learn about data structures, version control, networking, databases, security, web systems, agile development methodologies, design patterns, and more.
- Gain the core skills and confidence to hit the ground running as a software developer.
- https://www.wgtn.ac.nz/explore/postgraduate-programmes/master-of-software-development/overview

Master of Artificial Intelligence

- Able to demonstrate advanced knowledge of concepts and techniques behind Artificial Intelligence.
- Acquire skills to build AI tools with a wide range of applications and the potential to solve real-world problems across sectors like education, logistics, business, and the web.
- https://www.wgtn.ac.nz/explore/postgraduate-programmes/master-of-artifical-intelligence/overview