

Engineering Faculty Document No. EFD 11-24
February 29, 2024

Memorandum

To: The College of Engineering Faculty**From:** The Elmore Family School of Electrical and Computer Engineering**Re:** revision to the Automatic Control Concentration

The faculty of the Elmore Family School of Electrical and Computer Engineering has approved the following revisions of the Automatic Control Concentration from the College of Engineering. This action is now submitted to the Engineering Faculty with a recommendation for approval.

FROM:

Required Courses (4 credits)

ECE 30800 – Systems Simulation and Control Laboratory

ECE 38200 – Feedback System Analysis and Design

Selectives (6 credits)

VIP (Vertically Integrated Projects) and ECE 49600 Undergraduate Projects may be taken for a maximum of 3 credits toward the concentration upon approval of the Associate Head of Undergraduate Programs or Associate Head of Teaching and Learning.

ECE 48300 - Digital Control Systems Analysis And Design

ECE 49600 - Electrical And Computer Engineering Projects

ECE 56900 - Introduction To Robotic Systems

ECE 58000 - Optimization Methods For Systems And Control

VIP 37920 - Junior Participation In Vertically Integrated Projects (VIP)

VIP 47920 - Senior Participation In Vertically Integrated Projects (VIP)

TO:

Required Courses (4 credits)

ECE 30800 – Systems Simulation and Control Laboratory

ECE 38200 – Feedback System Analysis and Design

Selectives (6 credits)

ECE 48300 - Digital Control Systems Analysis And Design

ECE 56900 - Introduction To Robotic Systems

ECE 58000 - Optimization Methods For Systems And Control

MA 51100 – Linear Algebra with Applications

ECE 49595/59500 – Selected Topics in Electrical Engineering Qualifying Titles:

ECE 49595 – Introduction Reinforcement Learning

ECE 49595 – Introduction to Game Theory

ECE 59500 – Introduction to Game Theory

VIP (Vertically Integrated Projects) and ECE 49600 Undergraduate Projects may be taken for a maximum of 3 credits toward the concentration upon approval of the Associate Head of Undergraduate Programs or Associate Head of Teaching and Learning

ECE 49600 - Electrical And Computer Engineering Projects

VIP 37920 - Junior Participation In Vertically Integrated Projects (VIP)

VIP 47920 - Senior Participation In Vertically Integrated Projects (VIP)

Reason: The area added a few courses.



Mithuna Thottethodi

Associate Head of Teaching and Learning

Professor of Electrical and Computer Engineering

Automatic Control Concentration for Electrical Engineering

The concentration in Automatic Controls focuses on the area of control of dynamical systems, spanning a variety of application domains. The courses in this concentration will establish the fundamental theory and tools for modeling, analyzing, and designing controllers, including stability, performance, and robustness. It spans core topics such as frequency domain design, state-space control, digital control, robotics, optimization for control, as well as advanced courses in emerging topics.

Requirements (10 credits)

VIP (Vertically Integrated Projects) and ECE 49600 Undergraduate Projects may be taken for a maximum of 3 credits toward the concentration Selectives or Electives upon approval of the Associate Head of Undergraduate Programs or Associate Head of Teaching and Learning. If VIP or ECE 49600 are used to satisfy the selective requirement, they may not be used to meet the Elective credit below.

Required Courses (4 credits):

ECE 30800: Systems Simulation and Control Laboratory [1 credit]
ECE 38200: Feedback System Analysis and Design [3 credits]

Selectives (6 credits):

ECE 48300: Digital Control Systems Analysis and Design [3 credits]
ECE 49595/59500 – Selected Topics in Electrical Engineering Qualifying Titles:
 ECE 49595: Introduction to Reinforcement Learning [3 credits]
 ECE 59500: Introduction to Game Theory [3 credits]
ECE 56900: Introduction to Robotic Systems [3 credits]
ECE 58000: Optimization Methods for Systems and Control [3 credits]
MA 51100: Linear Algebra with Applications [3 credits]

With Approval of the Associate Head of Undergraduate Programs or Associate Head of Teaching and Learning, can include up to 3 hours of:

- VIP 37920 [2 credits]
- VIP 47920 [2 credits]
- ECE 49600 [1-3 credits]

The following table shows the results of the experiment. The data indicates that there is a significant difference between the two groups.

Group	Mean	Standard Deviation
Group 1	15.2	2.1
Group 2	18.7	3.5

The results of the experiment show that the mean score for Group 1 is significantly lower than that of Group 2. This suggests that the intervention had a positive effect on the outcome variable.

Further analysis of the data reveals that the standard deviation for Group 2 is higher than that of Group 1, indicating greater variability in the scores for that group.

In conclusion, the findings of this study support the hypothesis that the intervention leads to higher scores compared to the control group. Future research should explore the long-term effects of the intervention.