

課號 : ME 3007

類別 : 必修

名稱 : 自動控制

英文名稱 : Automatic Control

學分 : 3

適修年級 : 大三

課程大綱 : (1) Introduction

(2) Mathematical descriptions of models, Laplace transform, transfer function and state-space, block diagrams.

(3) Feedback control system characteristics.

(4) The performance of feedback control systems.

(5) Stability of feedback systems.

(6) The root-locus method.

(7) Frequency response methods: Bode diagram.

(8) Stability in the frequency domain: Nyquist criterion.

(9) Phase-lead and phase-lag controller design

預修課程 :

授課老師 : 王富正

課程說明 : This course introduces the ideas of automatic control, and focuses on the so-called classical control techniques, such as root-locus, Bode diagram and Nyquist criterion. First, we will talk about the concepts of systems and the mathematical descriptions of systems. Second, we will discuss the characteristics of feedback systems. Third, we will learn Routh-Hurwitz and root locus methods to analysis system stability. Lastly, we will introduce frequency response methods, such as Bode plot and Nyquist criterion.

After the course, the students are expected to have a solid understand about system modeling, closed-loop systems, and some classical control techniques. For further study, students are encouraged to take: Linear System Control, Digital Control, Signals and Systems, and Robust Control, e.t.c.

評分考試 : 小考 20%, 第一次期中考 25%, 第二次期中考 25%, 期末考 30%.

使用書籍 : *Modern Control Systems*, by Richard C. Dorf and Robert H. Bishop, 12<sup>th</sup> edition.

注意事項 :

(1) Students are expected to spend at least **3 hours/week** to review and practice the materials.

(2) TA: 李博智, 工綜 425, email: [pochihlee@ntu.edu.tw](mailto:pochihlee@ntu.edu.tw)

(3) Office hour: Monday 13:30~14:30. Please discuss with TA first, and make appointment.