



Sample Brief Course Description

Course title	Control Systems
Course code	ECE 330
College	Engineering
Department / Program	Electrical Engineering/ Electronics +Communications +Renewable Engineering
Year/ Level	4/8
Course Type	A. <input type="checkbox"/> University <input type="checkbox"/> College <input checked="" type="checkbox"/> Department <input type="checkbox"/> Others b. <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective
Credited Hours	3
Contact Hours	(LT:3, LB:0, TR:0)
Pre-requisites (if any)	ECE 270
Co-requisites (if any)	None
Course description	Introduction to control systems. Representation of physical control system elements. Transfer functions, Signal flow graphs. State space analysis. Sensitivity, static accuracy, and transient response. Stability of control systems: Routh criterion, Root locus, Frequency response methods, Nyquist stability criterion. Compensation techniques. Introduction to digital control and the Z transform. Discrete time control system.



Course Main Objectives	Students will be able to: <ol style="list-style-type: none">1. Develop mathematical models for linear dynamic systems in continuous and discrete time.2. Use time and frequency domain tools to analyze and predict the behavior of linear systems.3. Use time and frequency domain techniques to design feedback compensators to achieve a specified performance criterion.4. Use the software MATLAB to analysis and design system.
Learning Outcomes	<p>Knowledge and Understanding</p> <p>1.1 Identify mathematical concepts to describe the physical system and their modelling.</p> <p>1.2 Acquire fundamentals of control system including the transfer function, the state space modeling, and the design and analysis in the time-domain and the frequency-domain.</p> <p>1.3 Define fundamentals of feedback control systems to propose solutions that meet specified needs and discuss the importance of performance and stability in control design.</p> <p>Skills:</p> <p>2.1 Formulate and solve system equation and analyze transient and steady-state responses of control systems.</p> <p>2.2 Design systems, basic controllers, component, or process to meet desired needs and carry out search for technical issues.</p> <p>2.3 Communicate effectively with a range of audiences.</p> <p>Values:</p> <p>3.1 Support work teams providing leadership and creating a collaborative and inclusive environment while establishing goals to meet and planning tasks.</p>
References	<ol style="list-style-type: none">1. “Modern Control Systems”, Richard C. Dorf and Robert H. Bishop, 13th edition, Pearson, 2017 .2. “Automatic Control Systems”, 9th edition, FARID GOLNARAGHI, BENJAMIN C. KUO, JOHN WILEY & SONS, INC. 20103. “Feedback Control of Dynamic Systems”, 8th Edition, Gene F. Franklin J. David Powell, Abbas Emami-Naeini, Pearson, 2019.