PHYS4319 - Cyber-Physical Systems

PHYS 4319 Cyber-Physical Systems (3 semester credit hours) This course introduces students to cyber-physical systems - systems that involve the synergy between physical measurement, physical computation and physical control. Physical sensors paired with embedded computers and networks monitor and control physical processes, with feedback where physical processes affect computations and vice versa. Applications of such systems include laboratory instrumentation, process control, energy management and conservation, environmental control, aircraft control systems, communications systems, instrumentation, critical infrastructure control (electric power, water resources, and communications systems for example), robotics and distributed robotics (telepresence and telemedicine), defense systems, manufacturing, smart structures, medical devices and systems, consumer electronics, toys and games, assisted living, traffic control and safety, and automotive systems. The scientific, economic and societal potential of such systems is massive, and major investments are being made worldwide to develop the technology. The class will give hands on experience with micro-controllers, analog to digital converters, digital electronics interfaces, and cyber physical systems. Prerequisite: PHYS 2326. (3-0) R