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| COURSE TITLE | TE142470: Electronic Control Systems Design Credits: 2 ELECTIVE COURSE |
| LEARNING OBJECTIVES | Giving knowledge to the students in order to understand the electronic control system design. |
| COMPETENCY | <ul style="list-style-type: none"> • Students are able to analyze the electronic control system. • Students are able to design the electronic control system. |
| SUBJECTS | <ul style="list-style-type: none"> • Introduction includes control system terminology, history and future trend, analog and digital control overview • Signal Processing in Control includes time domain, frequency domain, stability criteria • Control System Implementation includes identification system, op-amp based analog control, microprocessor based digital control • State Space Method for Control System Design includes multivariable systems, pole placement, state observer, state feedback with integral control • Optimal and Robust Control System Design includes LQR, Kalman filter, LQG, robust control • Intelligent Control System Design includes fuzzy logic control system, neural network for control, GA for control applications. |
| MAIN REFERENCES | <ul style="list-style-type: none"> • M. Sam Fadali, <u>Digital Control Engineering: Analysis and Design</u>, Elsevier Inc., 2009. • Chi-Tsong Chen, <u>Analog and Digital Control System Design</u>, Saunders College Publishing, 2005. • M Gopal, <u>Digital Control and State Variable Methods: Conventional and Neuro-Fuzzy Control System</u>, McGraw Hill Inc., 2003 • F.L. Lewis & J. Campos, <u>Neuro-Fuzzy Control of Industrial Systems with Actuator Nonlinearities</u>, SIAM, 2002 |
| OPTIONAL REFERENCES | IEEE Transactions on Control Systems Technology |