Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Electrical Engineering
(Applicable from the academic session 2018-2019)

Name of the course		CONTROL SYSTEMLABORATORY
Course Code: PC-EE 593		Semester: 5th
Duration: 6 months		Maximum marks:100
Teaching Scheme		Examination scheme:
Theory: 0 hr/week		Continuous Internal Assessment:40
Tutorial: 0 hr/week		External Assessment: 60
Practical: 2 hrs/week		
Credit Points:1		
	Laboratory Experiments:	
1.	Familiarization with MAT-Lab control system tool box, MAT-Lab- simulink tool box & PSPICE	
2.	Determination of Step response for first order & Second order system with unity feedback with the help of CRO &calculation of control system specification , Time constant, % peak overshoot, settling time etc. from theresponse.	
3.	Simulation of Step response & Impulse response for type-0, type-1 & Type-2 system with unity feedback usingMATLAB & PSPICE.	
4.	Determination of Root locus, Bode plot, Nyquist plot using MATLAB control system tool box for a givensystem &stability by determining control system specification from the plot.	
5.	Determination of PI, PD and PID controller action of first order simulated process.	
6.	Determination of approximate transfer functions experimentally from Bode plot.	
7.	Evaluation of steady state error, setting time , percentage peak overshoot, gain margin, phase margin withaddition of Lead, Lag, Lead-lag compensator.	
8.	Study of a practical position control system obtaining closed step responses for gain setting corresponding toover-damped and under-damped responses. Determination of rise time and peak time using individualizedcomponents by simulation. Determination of un-damped natural frequency and damping ratio fromexperimental data.	
9.	Analysis of performance of Lead, Lag and Lead-Lag compensation circuits for a given system using simulation.	
10.	Determination of Transfer Function of a given system from State Variable model and vice versa.	
11.	Analysis of performance of a physical system using State variable technique by simulation.Study ofstep response and initial condition response for asingle input, two-output system in SV form by simulation.	

Institute may develop experiments based on the theory taught in addition to experiments mentioned.

Course outcome: After completion of this course, the learners will be able to

1. identify appropriate equipment and instruments for the experiment.
2. test the instrument for application to the experiment.
3. construct circuits with appropriate instruments and safety precautions.
4. use MAT-Lab control system tool box, MAT-Lab- simulink tool box & PSPICE for simulation of systems.
5. determinecontrol system specifications of first and second order systems.

6. validate   step response & impulse response for type-0, type-1 & Type-2 system with unity feedback using MATLAB & PSPICE.
7. work effectively in a team

Special Remarks: The above-mentioned outcomes are not limited. Institute may redefine outcomes based their program educational objective.