

<b>Course Code</b>	ME 306
<b>Course Title</b>	Control Systems
<b>No. of Credits</b>	3
<b>Pre-requisites</b>	None
<b>Compulsory / Optional</b>	Compulsory for mechanical engineering
<b>Aim(s) :</b> At the end of the course all students are able to model a system using transfer function method, analyze its dynamics in the time and frequency domain and use modern control engineering tools so that they will be able to design a feedback control system to given specifications	
<b>Intended Learning Outcomes :</b> On successful completion of the course, the students should be able to; <ol style="list-style-type: none"> <li>1. Model a dynamic system and analyze its dynamics in the time domain using transfer functions</li> <li>2. Develop a Bode plot and analyze the system characteristics in the frequency domain</li> <li>3. Design of controllers to meet control specifications and use commercially available software tools to do so</li> <li>4. Conduct a system identification using the frequency domain</li> <li>5. Take basic decisions based on robustness of a control design"</li> </ol>	
<b>Time Allocation (Hours) :</b> Lectures 5 , Assignment 85	
<b>Course content / Course description :</b> <ul style="list-style-type: none"> <li>• <b>Modelling, Transfer functions and block diagrams</b> – Modeling of systems, Transfer functions, Pole – zero mapping, Block diagrams</li> <li>• <b>Time domain analysis</b> – First – order system characteristics, Second- order system characteristics, Time – domain specifications, Stability of systems</li> <li>• <b>Design in the Time domain</b> – Root Locus, Introduction to PID control, PID control design</li> <li>• <b>Frequency domain analysis</b> – Frequency response, Bode plots, Frequency domain specifications, Relative stability, Compensation, Nyquist stability criterion, System identification</li> <li>• <b>Robust Control</b> – Introduction to robust control, Design Consideration</li> </ul>	
<b>Recommended Texts (if any) :</b> <ul style="list-style-type: none"> <li>• Benjamin C Kuo, Automatic Control Systems,</li> <li>• Katsushita Ogata, Modern Control Engineering,</li> <li>• Dorf &amp; Bishop, <i>Modern Control Systems</i> , Addison Wesley Longman, 8th Ed., 1998</li> <li>• Dutton, Thompson &amp; Barraclough, The Art of Control Engineering, Addison wesley Longman, 1997</li> <li>• Nise, Control Systems Engineering,</li> </ul>	

Evaluation	Percentage Mark
Assignments, Quizzes	20
Mid – Semester Examination	20
End – Semester Examination	60