

**Indian Institute of Technology Kanpur**  
**Department of Electrical Engineering**  
*EE250 Control Systems Analysis – Hand Out*  
*12<sup>th</sup> Jan 2021*

**Course Instructor:** Dr Laxmidhar Behera, WL212A, Department of EE

**Course Outline**

Contents	No of Lecture Hours	Date
Dynamic models and Response: State Variable Models, Impulse Response Models, Transfer function models, Dynamic response, Examples from mechanical, electrical, and biological systems, Feedback Systems, Block diagram representation, Signal flow graph	10 hrs	Tutorial Dates: 20 <sup>th</sup> Jan, 27 <sup>th</sup> Jan, 3 <sup>rd</sup> Feb
	Quiz I	3 <sup>rd</sup> Feb
s-plane Analysis: Feedback Control: PI, PD and PID, Response of a standard second order system, Dominant poles, Controller design concepts	4 hours	Tutorial Date: 10 <sup>th</sup> Feb
Stability: Routh Stability Criterion	2 hours	
	Quiz II	17 <sup>th</sup> Feb
<b>Mid Sem 21<sup>st</sup> Feb – 27<sup>th</sup> Feb</b>		
Root locus and compensator design – PI, PD, & PID	8 hours	Tutorial dates: 3 <sup>rd</sup> March, 10 <sup>th</sup> March
Nyquist Stability Criterion	4 hours	Tutorial 17 <sup>th</sup> March
	Quiz III	17 <sup>th</sup> March
Bode Plot and compensator design	8 hours	Tutorial Dates: 24 <sup>th</sup> March, 31 <sup>st</sup> March, 7 <sup>th</sup> April
	MATLAB Test	14 <sup>th</sup> April
State Variable Analysis	6 hours	Tutorial Date: 14 <sup>th</sup> April, 21 <sup>st</sup> April
	Quiz IV	21 <sup>st</sup> April
	MATLAB Test	28 <sup>th</sup> April
<b>End Sem Exam 3<sup>rd</sup> May – 12<sup>th</sup> May</b>		

## **Evaluation Components**

Mid Sem: 25%

Quiz: 15% (Best three out of 4 quizzes)

Matlab Test 15%

End Sem: 45 %

## **Text Book**

1. Madan Gopal, Control Systems: Principle and Design, Tata McGraw Hill, 2002
2. L Behera, Lecture Notes, 2014