

Complex Variables & Transform (CVT)

Main Topics

Complex Variables



Complex Functions

Limits, Derivatives in Complex Domain

Contour Integration

Laplace Equations

Applications

Transforms



Fourier Series

Fourier Transforms

Laplace Transforms

Signals & Systems

Complex Variables & Transform (CVT)

Main Topics

Partial Differential Equations



Introduction and basic ODEs

Modeling of Wave, Heat, Laplace equations

Fourier Series Solutions

Transmission Line Equation

Applications

BEE program at NUST-SECS

Complex Variables & Transform (CVT)

The course of complex variables and transform is a vital course in the EE department where the understanding of several advanced courses at both UG and PG level *entirely depends* on the core concepts of CVT. Needless to say research in these disciplines also *rely* on the understanding of basic concepts of a student in CVT.

In the subsequent slides a list of advanced courses (elective and non-elective) is given where CVT is a pre-requisite of all of them. Although CVT is *not* a pre-requisite of control systems at SEECS but at MIT and elsewhere it is a pre-requisite. Since control systems further divides into linear and nonlinear control systems therefore we may also pick up applications from these branches. Similarly we will also consider applications from **Linear Circuit Analysis & Electrical Network Analysis** which will be covered from the partial differential equations.

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Signals and Systems



Non-Electives



Electives

Digital Signal Processing



Digital Image Processing

Communication Systems



Communication Systems II

Mobile Communication Systems

Broadband Technologies

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Signals and Systems



Non-Electives



Electives

Control Systems



Digital Control Systems

Optimal Control

Introduction to Non-linear Control

CVT is a pre-requisite of Control Systems at MIT and Stanford

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Linear Circuit Analysis



Non-Electives



Electives

Electrical Network Analysis



Electrical Machines



Electromagnetic Field Theory



Opto-Electronics

Power System Analysis & Design

Electric Device

Microwave Engineering

Transmission Lines & Waveguides