**LECTURE I**

**Differential Equations (State variable form)**

(t)+(t)+……+(t)

**State variables**

(t)+(t)+……+(t)

**n first order DE**

(t) = ((t),(t), …,(t),(t)+(t)+, ……, +(t), t)

(t) = ((t),(t), …,(t),(t)+(t)+, ……, +(t), t)

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(t) = ((t),(t), …,(t),(t)+(t)+, ……, +(t), t)

x(t) **state vector of the system**

u(t) **control vector**

(t) = a(x(t), u(t), t) => **this is the state equations.**

**Araba sorusunun formüllerini yazılı eğer benzer bir şey çıkarsa buradan kullanırız.**

(t) = α(t) + β(t)

(t) d(t) and (t) (t) (t) = (t) (t) = x(t) + u(t)

(t) α(t) and (t) β(t) (t) = (t) + (t)

**Performance Constraint ;**

(t)]dt ≤ G

J = -

J = h(x( +

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**Conditions Of Optimality**

= 0 A point x at which f '(x) is zero is called an extremum of f.

If x\* is an interior point of [a, b] which is a minimum of f, then

So we shall now consider a multivariable function g(x) in a given domain Dn , such that

g(x) = g(x1 , x2 , . . . , xn )

If a point x\* in D is a minimum of g, then all the partial derivatives of g vanish at x\*, that is

If the gradient of g is 0 at x\* and if the matrix Q is positive definite then x\* is a minimum of g,

**guarantee that x\* is a minimum of g.**

**LECTURE II**

Controllable Canonical Form

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Observable Canonical Form

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Diagonal Canonical Form