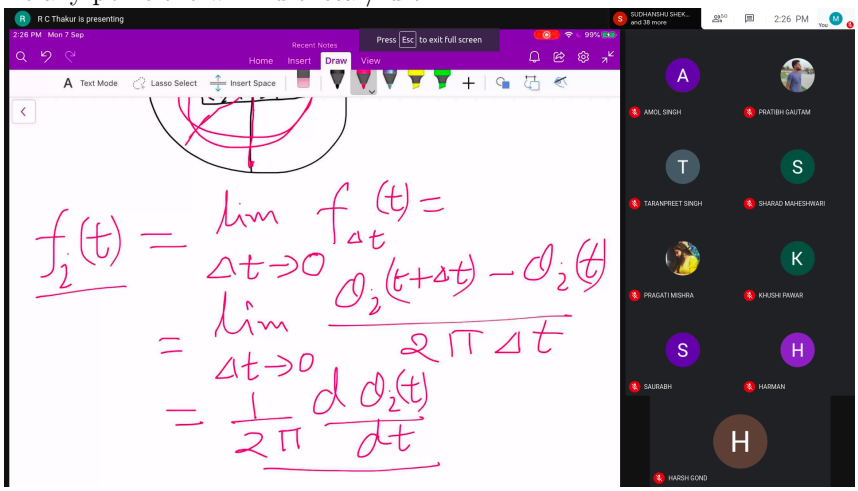
Angle Modulation

- Angle of carrier wave is carried in accordance with the modulating signal

Intro

- We say here that the general formula for the signal is Acos(theta(t))
- At any point the wi = d theta / d t
- 

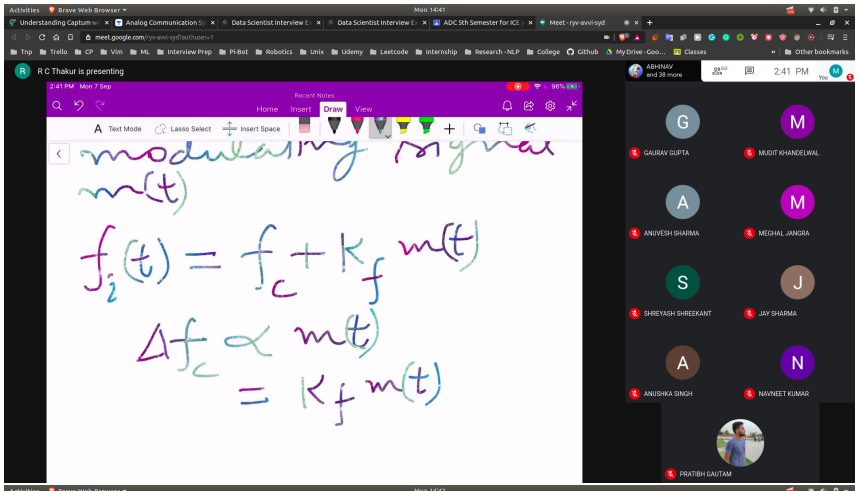
- Hence **instantaneous frequency** is given by fi = d theta/(2 * pi * dt)
- Further you can write the equation as
  - A cos(2 * pi * f * t + theta_c)
  - so we can vary frequency and theta_c
- So we have FM and PM (Phase modulation)

Phase Modulation

- phi_c = kp * m(t)
- here the angle is varied linearly with m(t)
- so phi_i(t) = (2 * pi * fc * t) + (kp * m(t))
- so the signal can be written as
  - Ac cos[(2 * pi * fc * t) + (Kp m(t))]

Frequency Modulation

- fi(t) is varied according to modulating signal at m(t)

- 
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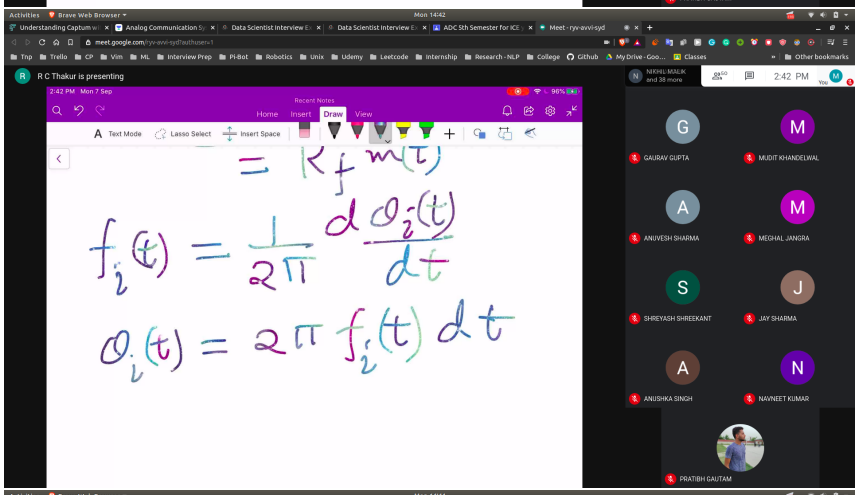
modulating signal
m(t)
$f_i(t) = f_c + K_f m(t)$
$\Delta f_c \propto m(t)$
$= K_f m(t)$
2:41 PM
GAURAV GUPTA
MUDIT KHANDELWAL
ANUVESH SHARMA
MEGHAL JANGRA
SHREYASH SHREEKANT
JAY SHARMA
ANUSHKA SINGH
NAVNEET KUMAR
PRATIBH GAUTAM
- 
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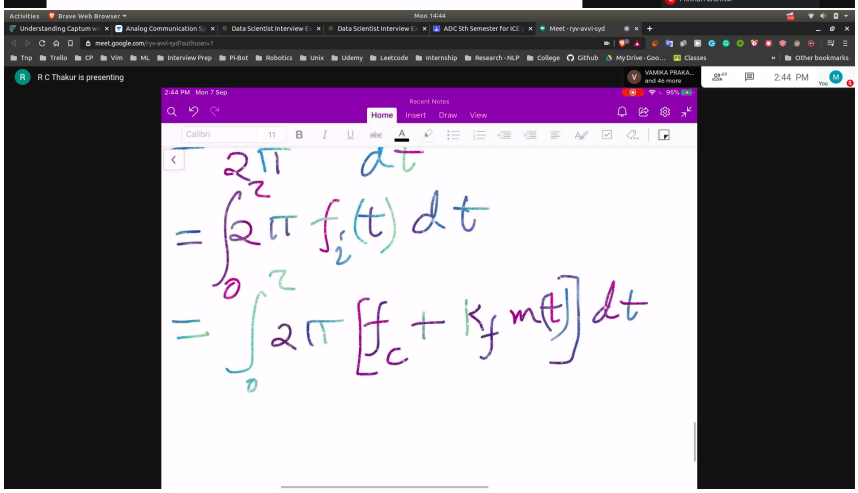
$= K_f m(t)$
$f_i(t) = \frac{1}{2\pi} \frac{d\theta_i(t)}{dt}$
$\theta_i(t) = 2\pi f_i(t) dt$
2:42 PM
GAURAV GUPTA
MUDIT KHANDELWAL
ANUVESH SHARMA
MEGHAL JANGRA
SHREYASH SHREEKANT
JAY SHARMA
ANUSHKA SINGH
NAVNEET KUMAR
PRATIBH GAUTAM
- 
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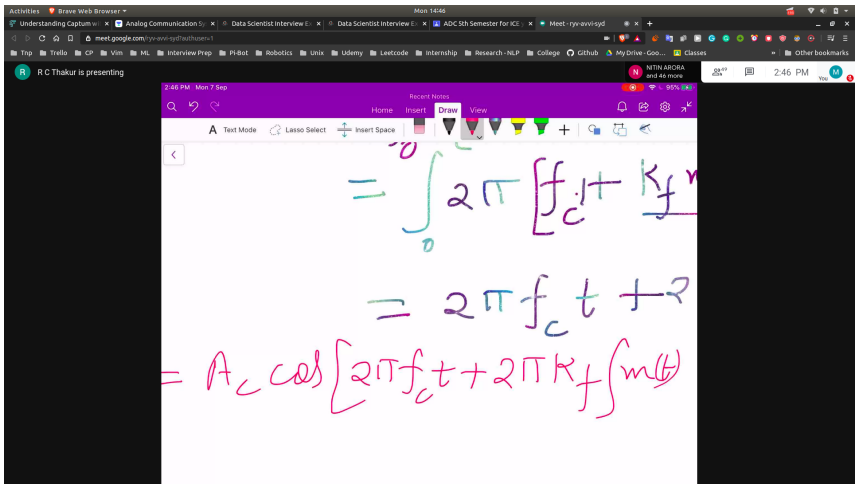
$\int_0^{2\pi} d\theta$
$= \int_0^{2\pi} 2\pi f_i(t) dt$
$= \int_0^{2\pi} 2\pi [f_c + K_f m(t)] dt$
2:44 PM

- 

FM AND PM ARE RELATED

- If we inc the value of PM>360 , then freq will inc.