# RĪGAS TEHNISKĀ UNIVERSITĀTE
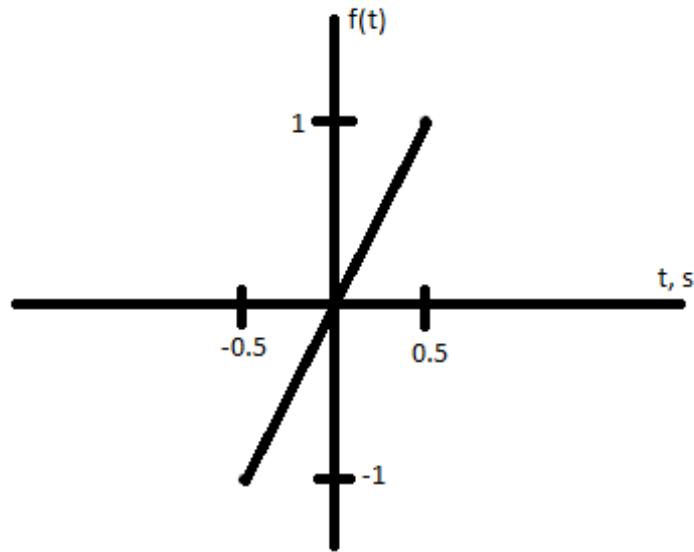
## ELEKTRONIKAS UN TELEKOMUNIKĀCIJU FAKULTĀTE

# 2.Laboratorijas darbs

# Signālu teorijas pamatos

"Iepazīšanās ar periodisku signālu izvērsi trigonometrisku funkciju Furjē rindā"

Deniss Karhu
151REB085
REBM0-1

T = 1s
T = 2l
l = 0.5

f(t) = 2t

$s(t) = \frac{a0}{2} + \sum_{n=1}^{\infty}(a_n \cos\frac{\pi n t}{l} + b_n \sin\frac{\pi n t}{l})$

tā kā f(t) ir nepara funkcija $a_n$ nav

$a_0 = \frac{1}{l}\int_{-l}^{l} f(t)dt = \frac{1}{0.5}\int_{-0.5}^{0.5} 2t\,dt = 0$

$b_n = \frac{1}{l}\int_{-l}^{l} f(t) * \sin(\frac{\pi n t}{l})\,dt = \frac{1}{0.5}\int_{-0.5}^{0.5} 2t * \sin(\frac{\pi n t}{0.5})\,dt = -\frac{1}{\pi n} * \cos(\pi n) + \frac{1}{\pi n \pi n} * \sin(\pi n) - \frac{1}{\pi n}$ $* \cos(-\pi n) - \frac{\sin(-\pi n)}{\pi n \pi n}$

$b_0 = -\frac{1}{\pi n} * \cos(\pi n) - \frac{\sin(\pi n)}{\pi n \pi n} - \frac{\cos(-\pi n)}{\pi n} - \frac{\sin(-\pi n)}{\pi n \pi n}$

$b_1 = -\frac{1}{\pi n} * \cos(\pi) - \frac{\sin(\pi)}{\pi\pi} - \frac{\cos(-\pi)}{\pi} - \frac{\sin(-\pi)}{\pi\pi} = 0.3183 + 0 + 0.3183 - 0 = 0.666$

$b_2 = -\frac{1}{2\pi} * \cos(2\pi) - \frac{\sin(2\pi)}{4\pi\pi} - \frac{\cos(-2\pi)}{2\pi} - \frac{\sin(-2\pi)}{4\pi\pi} = -0.318$

$b_3 = 0.2122$

$b_4 = -0.1592$