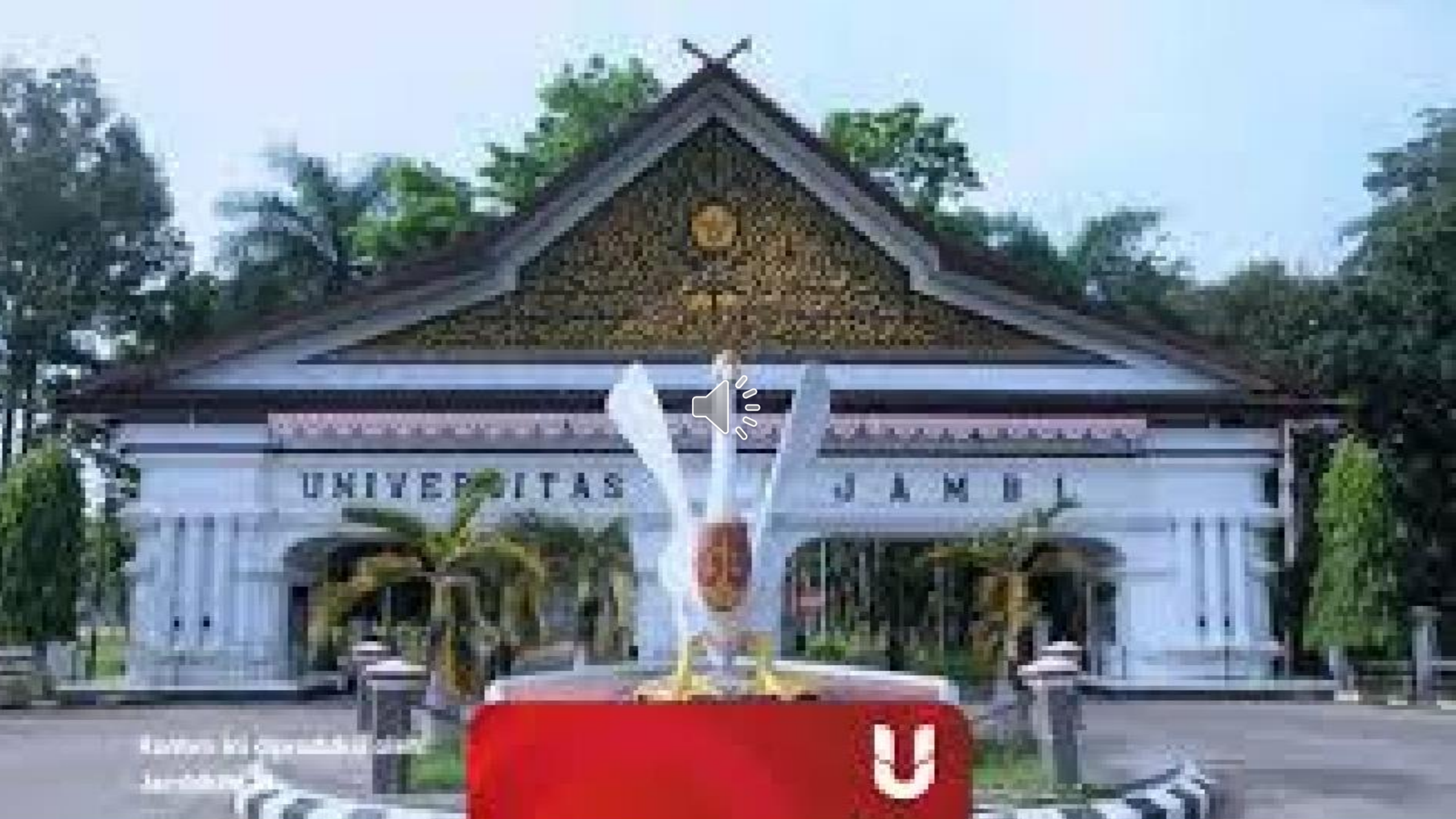
UNIVERSITAS
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Kampus Merdeka
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Integral
Logaritma dan Eksponensial

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INTEGRAL EKSPONENSIAL

$$\int e^x \, dx = e^x + C$$

$$\int e^{ax} dx = \frac{1}{a} e^{ax} + C, a \neq 0$$

CONTOH

1. $\int 9e^x \, dx = 9e^x + C$

2. $\int e^{9x} dx = \frac{1}{9} e^{9x} + C$

3. $\int 3\, e^{5x} dx = 3 \cdot \int e^{5x} dx = 3 \cdot \frac{1}{5} e^{5x} + C$

$$4.\int \frac{1}{3}x\cdot e^{5x^2-3}dx$$

$$U = 5x^2 - 3$$

$$du = 10x \rightarrow dx = \frac{du}{10x}$$

$$= \int \frac{1}{3}x\cdot e^{U}\cdot\frac{du}{10x}$$

$$= \frac{1}{3}\cdot\frac{1}{10}\int e^{U}du$$

$$= \frac{1}{30}e^{U} + C$$

$$= \frac{1}{30}e^{5x^{U}-3} + C$$

INTEGRAL LOGARITMA

$$\int \frac{1}{x} dx = \ln |x| + C$$

$$\int \ln x dx = x \cdot \ln |x| - x + C$$

$$\int a^x dx = \frac{a^x}{\ln a} + C$$

CONTOH

$$1.\int \frac{4}{x}dx = 4\int \frac{1}{x}dx = 4\cdot \ln|x| + C$$

$$2.\int (-\frac{5}{x} + e^{-2x})dx$$

$$= -5\int \frac{1}{x}dx + \int e^{-2x}dx$$

$$= -5\ln|x| + (-\frac{1}{2}e^{-2x}) + C$$

$$= -5\ln|x| - \frac{1}{2}e^{-2x} + C$$

$$3.\int \frac{1}{x \cdot \ln x}\,dx$$

$$U = \ln x$$

$$du = \frac{1}{x}\,dx$$

$$= \int \frac{1}{x} \cdot \frac{1}{\ln x}\,dx = \int \frac{1}{\ln x} \cdot \frac{1}{x}\,dx$$

$$= \int \frac{1}{U}\,du = \ln|U| + C = \ln|\ln x| + C$$

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