

Gujarat University
Choice Based Credit System (CBCS)
Semester-I
Syllabus

EC 101: Mathematical basics and Quantitative skills

Hours: 3/ week

Credit 2

Unit-1. Trigonometry:

Unit circle, trigonometric functions, values of trigonometric function at distinct points, relation among trigonometric functions, trigonometric formulae, $\sin(x \pm y)$, $\cos(x \pm y)$, $\tan(x \pm y)$, $\operatorname{sinc} \pm \operatorname{sind}$, $\operatorname{cosc} \pm \operatorname{cosd}$, $2\sin x \cos y$ (and others), inverse of trigonometric functions.

Unit-2. Co-ordinate Geometry and Vectors:

Distance Formula, Section Formula, Equation of a line and its slope, intersection of two lines, Equation of a circle and its tangent, elementary vector algebra.

Unit-3. Limit and Differentiation:

Right hand limit, Left hand limit and limit of a function. $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}$, $\lim_{x \rightarrow 0} \frac{\sin x}{x}$, $\lim_{h \rightarrow 0} \frac{a^h - 1}{h}$ and $\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n$, continuity, derivatives of x^n , e^x , $\log x$, trigonometric functions, inverse trigonometric functions, chain rule, geometric meaning of derivative.

Unit-4. Integration:

Integration of x^n , e^x , trigonometric functions, well known functions like $\frac{1}{x^2 \pm a^2}$, $\frac{1}{\sqrt{x^2 \pm a^2}}$, $\sqrt{x^2 \pm a^2}$, Method of substitution, integration by parts, definite integral (Up to Fundamental Theorem of Integral Calculus).

N.B. All the results / formulae are without proof.

Books: (1) Gujarat Rajya Pathya Pustak Mandal for std 11 and std 12.

(2) A Textbook for class XI & XII, National Council of Educational Research and Training.

(3) A Class Book of Mathematics for class XII by Chakrabarty S. K., Biswajit Bhagwati, S. Chand Publishers.

(4) Short Calculus by Serge Lang, Springer(India)