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, \( \sin(x \pm y) \), \( \cos(x \pm y) \), \( \tan(x \pm y) \), \( \sin c \pm \sin d \), \( \cos c \pm \cos d \),
\( 2\sin x\cos y \) (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. \( \lim_{x \to a} \frac{x^n-a^n}{x-a} \),
\( \lim_{x \to 0} \frac{\sin x}{x} \), \( \lim_{h \to 0} \frac{a^h-1}{h} \) and \( \lim_{n \to \infty} (1 + \frac{1}{n})^n \), 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
\( \frac{1}{x^2+a^2} \), \( \frac{1}{\sqrt{x^2+a^2}} \), \( \sqrt{x^2 \pm a^2} \), 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)