B.A. (Prog.) with Mathematics as Major (Sem I)
Teaching Plan (DSC-2: Topics in Calculus):

Weeks 1 and 2: Limit of a function, definition of a limit, Infinite limits, Continuity and types of discontinuities.
[1] Chapter 2.

Weeks 3 and 4: Differentiability of a function, Successive differentiation: Calculation of the nth derivatives, Leibnitz theorem.
[1] Chapter 3 (Sections 3.1, and 3.2), and Chapter 5.

Week 5: Partial differentiation, Euler's theorem on homogeneous functions.
[1] Chapter 12 [Section 12.2 (12.21 without proof, exclude 12.22 and 12.23), and Section 12.3].

Weeks 6 and 7: Rolle's theorem, Mean value theorems and applications to monotonic functions and inequalities.
[1] Chapter 7 (Sections 7.4 to 7.6).

Weeks 8 and 9: Taylor's theorem with Lagrange's and Cauchy's form of remainders, Definition and examples of convergent sequences and series, Taylor's series, Maclaurin's series expansions of e^x, $\sin x$, $\cos x$, $\log(1+x)$ and $(1+x)^m$.
[1] Chapter 6 (Brief introduction of convergence from the Sections 6.1 and 6.2).
[1] Chapter 7 (Sections 7.7, and 7.8).

Week 10: Indeterminate forms.
[1] Chapter 16.

Week 11: Asymptotes (parallel to axes and oblique).
[1] Chapter 9 (Sections 9.1 to 9.4).

Weeks 12 and 13: Concavity and inflexion points, Singular points (cusp, node and conjugate), Tangents at the origin and nature of singular points, Curve tracing (cartesian and polar equations).
[1] Chapter 10 (Section 10.7).
[1] Chapter 11. Use only statement for nature of double points in the Section 11.4.

Week 14 and 15: Reduction formulae for $\int \sin^n x\,dx, \int \cos^n x\,dx,$ and $\int \sin^m x \cos^n x\,dx$ and their applications. [2] Chapter 4 (Sections 4.1, 4.11, 4.12, and 4.13).

References:

1. Prasad, Gorakh (2016). *Differential Calculus* (19th ed.). Pothishala Pvt. Ltd. Allahabad.
2. Prasad, Gorakh (2015). *Integral Calculus*. Pothishala Pvt. Ltd. Allahabad.