At the end of this chapter (and additional course notes) you should be able to

1. Manually compute numerical derivatives of analytical functions, or of discrete data, using either forward, backward, or centered finite differences, or using Richardson Extrapolation.
2. Identify how the truncation errors of the above methods for numerical differentiation depend on the size of the interval used.
3. Identify the role of roundoff error in numerical differentiation
4. Contrast the use of curve fitting and interpolation for calculating numerical derivatives and integrals of discrete data.
5. Manually compute numerical integrals of analytical functions, or of discrete data, using the trapezoidal and Simpson's rules, or using Romberg integration.
6. Identify how the truncation errors of the above methods for numerical integration depend on the spacing of the points used.

Note: Sections of Chapter 11 *not* covered (and hence, you are not responsible for) are 11.3 to 11.6.