References to the book of Burden/Faires

The following list contains sections and subsections of the unit Numerical Analysis 23 and shows in which sections of the book "Numerical Analysis" by Burden and Faires the corresponding material can be found. This may be helpful if you want to read about a topic in more detail. Note that there is not a one-to-one correspondence between course and book. Often the book contains more material than was covered in the course. In a few isolated cases the course covered material that is not contained in the book. References refer to editions from the sixth onwards. In earlier editions the chapter numbering may be different.

Chapter 1: Root Finding

1.1 Introduction	
1.2 Linear systems of equations	Sections 1.2, 1.2.1 and 1.2.2
1.2.1 Triangular systems	are covered in sections **6.1,**
1.2.2 Gaussian elimination	**6.2** and part of **6.4** in the book
1.2.3 LU decomposition	section **6.5**
1.3 Root finding for a nonlinear equation	
1.3.1 Bisection method	section **2.1**
1.3.2 Fixed point iteration	sections **2.2** and **2.4**
1.3.3 Newton-Raphson method	sections **2.3** and **2.4**
1.3.4 Accelerating convergence	section **2.5**
1.4 Systems of nonlinear equations	
1.4.1 Newton's method	section **10.2**
1.4.2 Steepest descent	section **10.4**

Chapter 2: Differentiation and Integration

2.1 Differentiation	
2.1.1 Differentiation	section **4.1**
2.1.2 Richardson's extrapolation	section **4.2**
2.2 Integration	
2.2.1 Lagrange polynomials	section **3.1**
2.2.2 Trapezoidal rule	section **4.3**
2.2.3 Composite trapezoidal rule	section **4.4**
2.2.4 Simpson's rule	section **4.3**
2.2.5 Composite Simpson's rule	section **4.4**
2.2.6 Romberg integration	section **4.5**
2.2.7 Gaussian quadrature (more detail in course than book)	section **4.7, 8.2, 8.3**
2.2.8 Problems in the evaluation of integrals	section **4.9**

Chapter 3: Ordinary Differential Equations (IVPs)

	section **5.1**
3.1 Euler's method	section **5.2**
3.2 Runge-Kutta methods	section **5.4** (and part of **5.3**)
3.3 Multistep methods	section **5.6**
3.4 Stability	section **5.10**
3.5 Time stability (absolute stability)	section **5.11**
3.6 Systems of ODEs and higher order ODEs	section **5.9**

Chapter 4: Ordinary Differential Equations (BVPs)

4.1 Linear shooting method	section **11.1**
4.2 Shooting method for nonlinear problems	section **11.2**
4.3 Finite difference methods for linear problems	section **11.3**
4.4 Spectral methods for linear problems	not in book