

## ASE 211 Homework 7

Due: 12:00 noon, Friday, October 20.

Given the following data

i	$x_i$	$y_i$
1	0	4
2	1.1	-1.5
3	1.7	0.5
4	2.2	1.5

1. Compute the cubic spline matrix  $A$  and the right hand side  $\mathbf{g}$ , and solve for the vector of second derivatives  $\mathbf{s}$ .
2. Use  $\mathbf{s}$  to compute the coefficients of the cubic spline.
3. Use matlab to plot the cubic spline between  $x_1$  and  $x_n$  using the following  $m$  - file:

```
function plot_spline(a,b,c,d,n,x)
% function which plots a spline given its coefficients
% a(i),b(i),c(i),d(i), i=1 to n-1
% and the data points x(i), i=1 to n
%
aa=x(1);
bb=x(n);
h=(bb-aa)/100;
for i=1:100
    xx(i)=aa+i*h;
    for j=1:n-1
        if ((x(j) <= xx(i)) & (xx(i) <= x(j+1)))
            yy(i)=a(j)*(xx(i)-x(j))^3+b(j)*(xx(i)-x(j))^2+c(j)*(xx(i)-x(j))+d(j);
        end
    end
end
end
plot(xx,yy)
```