

Learning Programme

Fundamentals of data representation– A Level

Topic/Content	Objectives/Skills	Homework	Assessment	Stretch & Challenge (Thirst for Learning)
Binary number system				
Numbers with a fractional part	<ul style="list-style-type: none"> • Know how numbers with a fractional part can be represented in: <ul style="list-style-type: none"> ○ fixed point form in binary in a given number of bits ○ floating point form in binary in a given number of bits. • Be able to convert for each representation from: <ul style="list-style-type: none"> ○ decimal to binary of a given number of bits ○ binary to decimal of a given number of bits. 	Normalisation worksheet	Q and A's Past exam papers Homework and classwork worksheets and questions	
Rounding errors	<ul style="list-style-type: none"> • Know and be able to explain why both fixed point and floating point representation of decimal numbers may be inaccurate. 			
Absolute and relative errors	<ul style="list-style-type: none"> • Be able to calculate the absolute error of numerical data stored and processed in computer systems. • Be able to calculate the relative error of numerical data stored and processed in computer systems. • Compare absolute and relative errors for large and small magnitude numbers, and numbers close to one. 			

Range and precision	<ul style="list-style-type: none">• Compare the advantages and disadvantages of fixed point and floating point forms in terms of range, precision and speed of calculation.			
Normalisation of floating point form	<ul style="list-style-type: none">• Know why floating point numbers are normalised and be able to normalise un-normalised floating point numbers with positive or negative mantissas			
Underflow and overflow	<ul style="list-style-type: none">• Explain underflow and overflow and describe the circumstances in which they occur.			