MT4XH Design specification for a climate monitoring station on Arran
Autumn Term 2010
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Introduction
During your time in Arran you had a chance to observe many different measurement techniques and to see how they were used in an experimental setting. In this extended essay you will now have the opportunity to use the skills you learnt in practice to produce a design for a new climate monitoring station on Arran. You will spend this term thinking about the design and reading around the subject before submitting a design brief on Monday week 8.

Aims and design brief
The UK government wants to establish a new climate monitoring station at Loch Ranza. You have been asked to submit a design specification for the station. Your design specification should include:

1. A section outlining important parameters of the climate system that should be monitored and why.
2. A section listing the equipment that would be required to measure these parameters. You should include a rough estimate of the costs of purchasing and maintaining the equipment you require.
3. A section describing the particular challenges of monitoring the climate on Arran.
4. A section describing how your monitoring station would contribute to overall monitoring of UK and global climate, considering other land and satellite based instrumentation.
5. An outline of the operational procedure at the station and how data should be analysed once collected.

While on Arran you should think about the particular challenges involved in monitoring the climate and the equipment and techniques used to solve these challenges. You should also take the opportunity to talk to the lecturers from Reading and Leeds who are involved in the course about their particular expertise in Atmospheric monitoring. If you find some of the analysis you complete on Arran particularly relevant to this problem you should take a copy of the analysis, figures or data with you for later processing in Reading.

Your design specification should be no longer than 15 pages and can include diagrams and tables where necessary. References should be included in standard format at the end of the document. You should make use of the range of resources (including other academic and research staff) available to you in Reading.

Helpful content
Some ideas for helpful content are as follows.
Textbooks in the Meteorology library
An excellent basic resource is:
Measuring the atmosphere, Strangeways, 551.63
Other additional background
Mountain meteorology, Whiteman, 551.69143

The Encyclopedia of Atmospheric Science
There is also a large section on remote sensing under catalogue number 551.653

Web-based resources
The webpage of the global climate observing system organisation (GCOS) which contains many useful reports and technical documents:
http://www.wmo.int/pages/prog/gcos/
Met Office climate monitoring page
http://www.metoffice.gov.uk/climatechange/science/monitoring/
General information and introduction to space-based monitoring from NASA
http://climate.jpl.nasa.gov/
General information and introduction to space-based monitoring from ESA
http://earth.esa.int/applications/data_util/CLIMATE/

Journals with interesting content
More cutting edge information on methods for atmospheric measurement is presented in the journals *The Review of Scientific Instruments* and *Journal of Atmospheric and Oceanic Technology*. Articles are available free of charge from campus machines.

It is worth also searching other journals for more specific areas of interested, but be careful to avoid a too broad search.

Tutorials
In order to help you with the project, during the Autumn term we will hold three, one-hour tutorials. Please check your timetable for the time and location of these sessions. At each tutorial you should bring along the work you have already completed and share this with the rest of the group. We will also ask other research staff to attend and participate in the tutorials to give you some additional ideas about what you might want to include in your design specification. The project is deliberately open-ended and we hope will allow you to be creative in the way that you work and in the resources you use to plan your monitoring station.

Deadline
The deadline for submission of the report is Monday November 29th (week 8 of autumn term) and should be submitted in pdf format to the Blackboard drop box. You should expect results by Monday 17th January 2011 (week 2 of spring term).