Teaching Improvement Fund 2003 (Faculty of Science)

Title: Enhancing the employability of Science graduates: increasing the awareness of staff and students to the needs of the employers

Discipline-specific skills: the skills NOT covered by the project

Physics
A graduate in physics should possess:
problem formulation skills, the ability to apply physical laws to a wide range of physical situations;
problem solving skills, the ability to perform calculations to draw conclusions from given data;
data interpretation skills, the ability to organise information into a coherent framework and to relate it to previous results;
data analysis skills, the ability to assess the statistical significance of experimental results;
laboratory skills, the ability to design, assemble and use physics apparatus and to maintain written records; and
computer skills, the ability to use computers for data acquisition, data analysis and information retrieval.

Chemistry
A graduate in chemistry should possess:
problem formulation skills, the ability to apply chemistry theory to practice in order to design and carry out laboratory experiments;
problem solving skills, the ability to identify relevant information and apply it meaningfully to solve a problem;
data interpretation skills, the ability to use data appropriately to arrive at defensible conclusions;
data analysis skills, the ability to perform data analysis, recognize error propagation and apply appropriate statistical treatment to data;
laboratory skills, the ability to use chemistry specific apparatus and techniques, and to apply safe laboratory practices; and
computer skills, the ability to use standard computer programs in the analysis of data and presentation of results.

Mathematics and Statistics
All graduates in mathematics should possess:
problem formulation skills, the ability to formulate a wide range of problems in mathematical terms, the ability to recognise mathematical structures (such as groups) in a range of different contexts; and
problem solving skills, the ability to apply logical thinking to problems, using appropriate geometric, topological and analytical techniques.

All graduates in statistics should possess:
problem formulation skills, the ability to formulate a wide range of problems in mathematical and statistical terms;
problem solving skills, the ability to apply logical thinking to problems, using appropriate statistical and analytical techniques;
data presentation skills, the use of computers to present statistical data in appropriate form including graphical techniques;
data interpretation and analysis skills, the ability to apply appropriate statistical techniques to the analysis and interpretation of data; and
computer skills, the ability to use statistical software packages for the analysis and interpretation of data.

Many graduates will have other skills; all graduates will have the skills listed above.

Geosciences
A graduate in the geosciences should possess:
problem formulation skills, the ability to perceive spatial and temporal relationships between individual objects and related groups of objects; the ability to apply social theory and/or natural science concepts to an understanding of relationships within and between society and environment;
problem solving skills, the ability to apply theory and methods from either or both the natural and social sciences to earth processes and social systems; the ability to use relevant data to solve applied problems relevant to human interaction with the natural environment;
data presentation skills, competence in map reading, map making and the interpretation of maps; use of common software in tabular and graphic presentation;
data interpretation skills, the ability to recognize the significance of interrelated spatial and temporal changes, and to make decisions on the basis of absent, sparse or insufficient data; the ability to synthesize complex
information;
fieldwork skills, the ability to orient in the field, collect appropriate data and/or samples and observations and to take adequate notes; and carry out surveys;
computer skills, knowledge of and competence in the use of appropriate software packages; and
laboratory skills, the ability to use appropriate apparatus and techniques, and to apply safe laboratory practices.

Many graduates will have other skills more specifically relevant to the Geography, Geology and Geophysics sub-disciplines within Geosciences; all graduates will have the skills listed above.

Microbiology
A graduate in microbiology should possess:
laboratory skills, the ability to design and implement microbiological experiments, and to handle micro-organisms in a safe and competent manner.

Biochemistry
A graduate in biochemistry should possess:
problem formulation skills, the ability to apply theoretical principles to practice in order to design and carry out laboratory experiments;
problem solving skills, the ability to apply logical thinking to a situation, and to use relevant information to solve the problem;
data presentation skills, the ability to communicate results appropriately both in oral and written form;
data analysis skills, the ability to organize and manipulate acquired data into a form from which conclusions may be drawn;
data interpretation skills, the ability to recognize the significance of results and to draw appropriate conclusions;
laboratory skills, the ability to use discipline-specific apparatus and techniques appropriately and to transfer these skills to new experimental situations; and
computer skills, the ability to use computers for data analysis, information retrieval and presentation of results and to be competent in the use of standard programs.

Psychology
A graduate in psychology, in general, should possess:
problem formulation skills, experience with hypothesis testing;
problem solving skills, the ability to design experiments, apply controls and collect appropriate data by conducting interviews and constructing questionnaires;
data analysis skills, knowledge of and competence in the use of appropriate statistical methods;
laboratory skills, familiarity with apparatus and standard psychophysical and psychophisiological methods, and the ability to carry out histological analyses and electrode implantation in animals; and
computer skills, competence with computer controlled experimentation.

Computer Science
A graduate in computer science should possess:
problem formulation skills, confidence in tackling problems without a clear specification, and in applying theoretical models (e.g. finite state machine, context-free grammar, graph algorithms);
problem solving skills, the ability to learn new languages from manuals and tutorials, experience with planning, quality control and time management;
data analysis skills, the ability to evaluate alternative programs or techniques when presented with a small number of well-defined alternatives; and
computer skills, the ability to write well structured programs in a common object-oriented language, to develop software testing procedures and to write documentation for software, to modify and port existing programs.

Information Systems
A graduate in information systems should possess:

Biological Sciences
A graduate in the biological sciences should possess: