SCIENCE MATHEMATICS AND TECHNOLOGY FOR STUDENTS MATRICULATED BEFORE JAN. 2009

Science Mathematics and Technology Guidelines for Students Matriculated Before Jan 1 2009

Concentrations in science, mathematics and technology (SMT) may include work in the natural sciences (physics, chemistry and biology), mathematics, computer science and a range of technological, applied science and health-related fields. Organizing frameworks may be disciplinary, interdisciplinary, thematic, problem oriented or professional/vocational.

Degree programs in science, mathematics and technology should include:

- An understanding of the definition and scope of a field or area, including its fundamental laws and concepts.
- Basic competencies needed to work in science, mathematics and technology, such as:
  - Working knowledge of scientific methodology including laboratory techniques and data interpretation.
  - Working knowledge of needed mathematics.
  - Communication skills including technical writing, data presentation and scientific argumentation.
  - Familiarity with established computer applications to the particular field of interest.
- Knowledge in appropriate supporting areas and significantly related fields (e.g., calculus for advanced scientific study; organic chemistry for advanced study in the biological sciences).
- A progression of study which leads to the development of in-depth knowledge and skills, which should be carried out at an advanced level within the concentration, and should include:
  - Resource acquisition skills, including skills in information gathering.
  - Problem-solving skills, including definition, analysis, research design, evaluation and testing, as well as knowledge of appropriate experimental and applications methodologies.
  - An increasingly critical and sophisticated understanding of the theoretical and conceptual models of the field.
  - An awareness of the field or area as an ongoing area of inquiry, including knowledge of recent developments.

Since knowledge in science, mathematics and technology is rapidly and continually evolving, students in this area should develop skills for acquiring knowledge independently, in order to avoid scientific and technological obsolescence. Skill in pursuing knowledge independently involves:

- Knowledge of the inter-relationships and domains of various fields in science, mathematics and technology related to the concentration.
- Awareness of the range and limits of one's own skills and knowledge.

- Development of a critical perspective which allows one to compare and evaluate theories, models and experimental work in new areas of study.

Finally, the student's degree studies should provide an awareness of the wider context in which science and technology operate. This includes such elements as:

- Understanding the relationships between science and its applications.
- Understanding the relationships between science and technology and society.
- Understanding the potential limitations of science and technology.

It is not necessary that everything in the previously listed areas of knowledge, skills and competencies be included explicitly in student degree programs as specific study topics. Students should, however, address the way in which their proposed SMT program responds to these guidelines; this could certainly be included within the description and discussion contained in the degree program rationale.

Additional specific guidelines have been developed for concentrations in the following areas:

biology
chemistry
computer science
environmental science
information systems
information technology
mathematics
physics
technology