**CSC 2109 Discrete Mathematics**

(a) Description

The course applies mathematics to finite or discontinuous quantities in order to master the process of problem-solving, communication, reasoning, and modeling. It gives a basic understanding of mathematical structures that are fundamentally discrete. Objects studied in discrete mathematics are largely countable sets such as integers, finite graphs, and formal languages. Applications of such concepts to computer science are to be studied. Concepts and notations from discrete mathematics are useful in studying and describing objects and problems in computer algorithms and programming languages.

(b) Aims

The aim of this course is to provide the student with: -

*•* A basic understanding of mathematical objects that assume only distinct, separate values, rather than values on a continuum.

*•* The main ideas studied in the broad area of Discrete Mathematics especially clear algorithmic aspects.

*•* An understanding of what the relation between problems is.

(c) Teaching and Learning pattern

Teaching and learning will be by lectures and tutorials

(d) Indicative content

*•* Logics and set theory

*•* Number theory

*•* Relations and functions

*•* Languages

*•* Finite state machines (and optionally Finite state automata)

*•* Groups and Modulo Arithmetic

*•* Number of solutions of a linear equation

*•* Recurrence relations

*•* Searching algorithms

(e) Assessment method

Assessment will be by assignments and/or tests (40%) and written examination (60%)

(f ) Reading list

(i) Bobrow, L.S. and Arbib, M.A. Discrete Mathematics: Applied Algebra for Computer and Information Science. Philadelphia, PA: Saunders, 1974.

(ii) Dossey, J.A.; Otto, AD.; Spence, L.; and Eynden, C.V. Discrete

Mathematics, 3rd ed. Reading, MA: Addison-Wesley, 1997.

(iii) Balakrishnan, V.K. Introductory Discrete Mathematics. New York: Dover, 1997.