**CENTRAL UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY**

**Course Code**: ITEC212 **Credit Hour(s)**: **3** **Webpage** :

**Course Title**: Discrete Mathematics II

**Course Lecturer: Regina Naa Dedei Crabbe Room: BLOCK C**

**Email Address: rndcrabbe@gmail.com Tel no.:0244893514**

**Office Hours:**

# Course Objective

At the end of this course, students should be able to:

* Explain the concepts and theories of discrete mathematics
* Construct and evaluate logical arguments.
* Apply and adapt a variety of appropriate strategies to solve mathematical problems.
* Apply mathematics in real-life contexts
* Analyze issues using mathematical thinking

# Course Description

This is a continuation of ITEC203 course. It is intended to serve as a foundation course that will facilitate understanding of other course in the Information Technology Programme. The main topics to be discussed are introduction to Finite State Automata, Proof Techniques, Multinomial coefficient, Complex numbers, Demoivre theorems. Others are boolean algebra, basic Boolean function and digital logic gates.

# Learning Outcomes

At the end of this course, students should be able to:

* Solve problems on Multinomial coefficient, Complex numbers, and Demoivre theorems,
* Know how the finite state automata works
* Understand the various proof techniques
* Solve questions on boolean algebra, basic Boolean function and digital logic gates

# Instructional Methods

Instructional approaches to be used during the course (e.g., lectures, presentations and assign readings). Note that attendance is also a requirement.

# Required Course Materials and Readings

Gries, D., & Schneider, F. B. (1993). *A logical approach to discrete mathematics.* Glasgow: Springer.

Grossman, P. (2002). *Discrete mathematics for computing.* New York, NY: Palgrave, Macmillan.

Johnsonbaugh, R. (2004). *Discrete mathematics.* London: Pearson Prentice Hall.

Rajagopalan, S. R., & Sattanathan, R. (2005). *Allied mathematics.* New Delhi: Vikas Publications.

# Evaluation

Quiz 10%

Assignment 10%

Mid-Semester Exams 20%

End of Semester Exams 60%

Total 100%

# Commit To Academic Integrity

Students in the department are expected to maintain **high degrees of professionalism,** **commitment to active learning, participation and academic integrity every time**.

# Academic Dishonesty

Please note that students involved in academic dishonesty will receive a **ZERO** mark on the particular component in which the infraction occurred and a notation of academic dishonesty in the departmental office. This may also reflect on references written by the department.

**It is the student’s responsibility to understand what constitutes academic dishonesty.**

# Missed Exams / Tests / Assignments

**Assignment Submission**: Assignments must be received on the due date specified for the assignment.

**Lateness Penalty:** Assignments received later than the due date will be penalized Exceptions to the lateness penalty for valid reasons such as illness, etc., may be entertained by the Lecturer but will require supporting documentation (e.g., a doctor’s letter).

**Missed Tests:** Students with a documented reason for missing a course test, such as illness, which is confirmed by supporting documentation (e.g., doctor’s letter) will be handled by the Lecturer.

**WEEK BY WEEK COURSE SCHEDULE / ORGANISER:**

| **Week** | **Topic** | **Activities** | **Due Date** |
| --- | --- | --- | --- |
| 1-3 | **Boolean Algebra**  Boolean operations  Boolean Expressions and  Boolean Functions | Lecture begins  Exercise |  |
| 4-5 | **Digital logic gates**  AND, OR, NOT, NAND, NOR, Exclusive OR (XOR) and Exclusive NOR (XNOR) logic gates; Truth Tables for logical circuits; Truth Tables to prove Boolean theorems etc. |  |  |
| 6-7 | **Finite State Automata** | Lecture |  |
| 8-9 | **Multinomial Coefficient**  Binomial Theorem  Binomial Coefficient  Multinomial Theorem | Mid Semester Exams |  |
| 10-12 | **Complex Numbers**  Addition and subtraction of complex numbers  Multiplication and division of complex numbers  Representation of complex numbers on a plane  Conversion of complex numbers from rectangular to polar form and vice versa | Lecture  Assignment |  |
| 13 |  |  |  |
|  |  |  |  |
|  |  | Lectures end |  |
|  |  | Revision Week |  |
|  |  | Exams begin |  |
|  |  | Second Semester Break |  |