1. College	**Chancellor College**
2. Faculty/School of	Science
3. Department	Mathematical Sciences
4. Programme	Bachelor of Science in Mathematics
5. Module Title	Discrete Mathematics with Applications
6. Module Code	MAT 212
7. Year	Two
8. Credits	12
9. Number of Lectures per week	3
10.Number of Tutorials/Practicals per Week	1
11. Revised	After 5 years
12. Approval Date	August 2016

13. Prerequisites: MAT111, MAT121

14. Co-requisites: MAT211

15. Module Aims

To provide students with basic knowledge in Discrete Mathematics

16. Intended Learning Outcomes

On successful completion of this module, students should be able to:

a) solve problems using counting techniques,
b) analyse problems using the pigeon-hole principle,
c) prove graph theory concepts,
d) apply graph theory techniques to real life problems,
e) solve different equations

17. Indicative Content

a) Counting techniques: the product rule, the sum rule, combinations and permutations, inclusion and exclusion principle, multinomial theorem, generating functions

b) Pigeon-hole principle: simplest form, regular form, generalized form.
c) Introduction to graph theory: valency degree, path's chains, cycles, vertex colouring and time tabling, spanning trees, search trees, genetic tree, allocation problem and networks.
d) Difference equations: iteration, root method, generating functions, formulation of relations

18. Assessment

Continuous Assessment 40%; Final Examination 60%.

19. Teaching and Learning Methods / Activities

Lectures, group work, class presentations, periodic homework and assignments.

20. Recommended Resources and Prescribed Reading Lists

Prescribed Readings

Roberts, F.S., (2008). *Applied Combinatorics* (2nd ed.). New Jersey: Prentice-Hall.

Rosen, K.H., (2007). *Discrete Mathematics and Its Applications* (6th ed.). New York : McGraw-Hill Education.

Brown, J.I. (2013). *Discrete Structures and their Interactions (Discrete Mathematics and Its applications)*. London: Chapman and Hall

Recommended Readings

Anderson, I., (2000). *A First Course in Discrete Mathematics* (2002 ed.). New York: Springer.

Poyla, G., Tarjan, R.E., & Woods, D.R., (2009). *Notes on Introductory Combinatorics* . New York: Birkhäuser.

Grimaldi. R.P. (2003). *Disrete and Combinatorial Mathematics (An applied approach)* (5th ed.). Bloomington: Pearson