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**MULTIMEDIA UNIVERSITY OF KENYA**

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**(MMU is ISO 9001:2008 certified)**

**DEPARTMENT OF MATHEMATICS**

**COURSE OUTLINE**

**UNIT CODE:** SMA 2104 **UNIT NAME:** Mathematics for Science

**LECTURER NAME:** Peter Nyagah  **CONTACTS:** [peter.nyagah@mmu.ac.ke](mailto:peter.nyagah@mmu.ac.ke)

**LECTURE CONTACT HOURS** - 45 HOURS

**Prerequisite:** None

**Purpose:**

To provide students with basic mathematical tools and abilities of algebra, trigonometry, permutation and combinations, series and complex numbers

**Learning outcomes:**

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

1. Form and solve quadratic equations
2. Solve mathematical problems involving series and trigonometry
3. Perform mathematical operations involving complex numbers

**Teaching methodology**: Lectures, tutorials; and group discussions

**Instruction materials/equipment:**

1. Liquid Crystal Displays.
2. White boards/black boards
3. Flip charts

**Course Assessment:**

Continuous Assessment 30%

End of Semester Examination 70%

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| **LECTURE/WEEK** | **COURSE CONTENT** | **REMARKS** |
|  | Surds, logarithms and indices; |  |
|  | Determination of linear laws from experimental data; Quadratic functions, equations and inequalities |  |
|  | Remainder theorem and its application to solution of factorisable polynomial equations and inequalities; |  |
|  | Permutations and combinations;  Cat 1/Assignment 1 |  |
|  | Series: finite, infinite, arithmetic, geometric and |  |
|  | Binomial series, and their applications such as compound interest, approximations, growth and decay; |  |
|  | The principle of induction and examples such as formulae for summation of series and properties of divisibility; |  |
|  | Trigonometry; trigonometric functions, their graphs and inverses for degree and radian measure, addition, multiple angle and factor formulae, trigonometric identities and equations; |  |
|  | Sine and cosine formulae; their application to solution of triangles, trigonometric identities; |  |
|  | Complex numbers: Argand diagrams, arithmetic operations and their geometric representation; Modulus and argument; |  |
|  | De Moivre’s theorem and its applications to trigonometric identities and roots of complex numbers. |  |

**Core Reading Materials:**

**Course Textbooks**

1. Uppal S.M. and Humphreys H.M. (2008). *Mathematics for Science,* (2nd Ed.). New Delhi, India: New Age International Pvt Ltd Publishers. ISBN-13: 978-8122409949
2. Backhouse J.K. (2007). Pure Mathematics 1 (4th Ed.). NY, USA: Longman. ISBN-13: 978-0582353879
3. Sullivan M. (2011). Algebra and Trigonometry (9th Ed.). Canada: Pearson Education. ISBN-13: 978-0321716569

**Course Journals**

1. *IMA Journal of Applied Mathematics*, Oxford University Press. ISSN 0272-4960.
2. *American Journal of Mathematics*, The Johns Hopkins University Press. ISSN: 0002-9327
3. *Advances in Theoretical and Mathematical Physics,* International Press. ISSN: 1095-0761.

**Reference Materials:**

**Reference Textbooks**

1. McKeague C.M. (2011). *Elementary Algebra,* (9th Ed.). New Delhi, India: Cengage Learning. ISBN-13: 978-0840064219
2. McKeague C.M. (2009). *Basic Mathematics*, (7th Ed.). New Delhi, India: Cengage Learning. ISBN-13:978-0534378929
3. Aufmann R.N., Barker V.C. and Nation R.D. (2007). *College Algebra and Trigonometry* (6th Ed.). Boston, USA: Houghton Mifflin. ISBN-13: 978-0618825158

**Reference Journals**

1. *ActaNumerica.* Cambridge University Press. ISSN: 0962-4929
2. *European Journal of Applied Mathematics.* Cambridge University Press. ISSN: 0956-7925
3. *Communications on Pure and Applied Mathematics Journal.* Wiley Periodicals. ISSN: 1097-0312

Signature: ……………………………………. Date Submitted: ……………………………….