NATIONAL UNIVERSITY OF SINGAPORE

Department of Mathematics

MA4247 Complex Analysis II

Course Outline

Lecturer: A/P Tan Ser Peow

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Course website:

https://ivle.nus.edu.sg/

Go to module MA4247. Note that all course material (lecture notes, tutorials etc will be available from the IVLE website, also important announcements relating to the course, homework, midterms and exams will be posted there.

Lectures:

Every Monday and Thursday 2.00-3.40 pm, S1A-0212

(Note: Lecture on 10 Sep (Thursday) will be canceled as lecturer will be on conference leave).

Tutorial class and Homework: Once every week.

Tutorial slots: TBA. There will probably be two tutorial slots. Students should be prepared to form into groups of 4 for the purpose of working on tutorials.

Assessment:

Final examination (1 Dec, Thurs, evening), 2.5 hours - 60%.

Midterm test: Date: Monday 5 Oct 2009 - 25%.

Homework and other continual assessment - 15%.

Main Textbook:

• J. Brown & R. Churchill, *Complex Variables & Applications*, 7th ed., McGraw Hill.
(This is the main text although lectures will not necessarily follow that closely with the material here if other references provide better treatment for a particular chapter. It is relatively easy to read and written in a style which is acessible to engineers.)

Other supplementary references:

• L. V. Ahlfors, *Complex Analysis*, 3rd edition, McGraw Hill.
(This is a classic text by one of the leading experts. Beautifully written although it is generally considered difficult by undergraduates.)

• E.B. Saff and A.D. Snider, *Fundamentals of complex analysis for Mathematics, Science and Engineering*, Prentice Hall.
(Relatively easy to read, written mostly for an engineering audience.)

• D. Mumford, C. Series and D. Wright, *Indra's Pearls. The vision of Felix Klein.* Cambridge University Press.
(A new book with lots of beautiful pictures. Written in a leisurely way, it is especially useful for the sections on conformal mappings and linear fractional transformations. Useful for understanding the geometry underlying the complex analysis.
See also the website http://klein.math.okstate.edu/IndrasPearls/)

MA4247 Course Content

• Review of complex numbers, differentiation, Cauchy-Riemann equations, analytic functions, contour integration, Taylor series and Laurent series, singularities and poles, residue theorem.
• Maximum modulus principle.
• The argument principle.
• Rouche's Theorem.
• Open mapping Theorem.
• Analytic continuation.
• Conformal mappings.
• Linear fractional transformations.
• Harmonic functions.