INDIAN INSTITUTE OF TECHNOLOGY GANDHINAGAR
DISCIPLINE OF MATHEMATICS

MA 502: COMPLEX ANALYSIS
Course Plan for Semester II: 2019-2020

Instructor: ATUL DIXIT
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Office: Academic Block 5, Room 340

COURSE CONTENTS (Tentative)

Spherical representation of extended complex plane, Analytic Functions, Harmonic Conjugates, Elementary Functions, Cauchy Theorem and Integral Formula, Homotopic version, Power Series, Analytic Continuation and Taylor's theorem, Zeros of Analytic functions, Hurwitz Theorem, Maximum Modulus Theorem and Open Mapping Theorem, Laurent's Theorem, Classification of singularities, Residue theorem and applications, Evaluation of real integrals, Argument Principle, Theorems of Rouche and Gauss-Lucas, Winding numbers, Mobius Transformations.

Other topics: Weierstrass factorization theorem, Gamma function, Riemann zeta function, Schwarz-Christoffel Transformation, Fractals, Algorithms to generate Sierpinski Gasket.

Note: Selection of topics listed under 'Other topics' will be done at the discretion of the instructor.

Texts/References

1.Stein and Shakarchi, *Complex Analysis*, Princeton Lectures in Analysis, 2, Princeton University Press, Princeton, NJ, 2003. xviii+379 pp.

2. Conway, John B., *Functions of One Complex Variable*, Second Edition, Springer International Student Edition.

3. Gamelin, Theodore W, *Complex analysis*, Undergraduate Texts in Mathematics. Springer-Verlag, New York, 2001. xviii+478 pp.

4. Bak, Joseph; Newman, Donald J, *Complex analysis*, Second edition, Undergraduate Texts in Mathematics. Springer-Verlag, New York, 1997.

LECTURES AND TUTORIALS

Lectures: Tuesday, Wednesday and Friday: 10:05 am - 11 am in 7/207.

Tutorial: TBA

Office hours: TBA

GRADING POLICY

Quiz + Assignments: 15% + 15 %
Mid-semester exam: 30%
End semester exam: 40%

ACADEMIC INTEGRITY

It is absolutely necessary to work on each of the problems assigned for homework. Students are expected and encouraged to discuss mathematics with other students, however, the homework solutions **must be written in your own words**. Mere copying of others' work is strictly prohibited.
      The Institute takes academic integrity very seriously. Any confirmed instances of academic dishonesty, including (but not limited to) cheating or copying on exams, class tests or quizzes will face harsh disciplinary action.

GRADING RUBRIC

Relative grading policy will be followed.

DATES

The date and time for the Class Quiz will be announced in advance. The mid-semester and end-semester examinations will be conducted as per the Institute schedule.