SC 105 – Calculus and Complex Variables
Instructor Manish K Gupta (www.mankg.com)
Room 2209 FB 2 mankg [at] daiict.ac.in
Phone: 91-79-30510549

Office Hours:

Friday 3:00 to 6:00 pm every week

Class Time and Place : Monday 9:30 am (LT-3) Wed 9:30 am (LT-3) and
Thursday 8:30 am (LT-3)

Tutors

Prof. V. Sunitha, Room 1212 FB 1, Phone: 563
Email: v_suni@daiict.ac.in

Prof. Rahul Muthu, Room 1202 FB 1, Phone: 564
Email: rahul_muthu@daiict.ac.in

Teaching Assistants

TA1:  TBD(@daiict.ac.in)
TA2:  TBD(@daiict.ac.in)

Tutorials time, Group and Place: 1:00 pm all 4 days
Monday (Group 3, Room CEP 202)
Tuesday (Group 4, Room CEP 202)
Wednesday (Group 1, Room CEP 202)
Thursday (Group 2, Room CEP 202)

Overview

This exciting course is foundation to your ICT degree. In this course, we shall
study some basic calculus of real variables, complex variables and shall see how
to solve basic ordinary and partial differential equations with some applications.

Tentative Course Content

Week | Topics
--- | ---
1 (July 26) | Introduction, functions of single variable-Mean value theorems and Taylor's theorem
2 (Aug 2) | Fundamental theorem of integral calculus, definite integrals, trapezoidal and Simpson's rules
3 (Aug 9) | Functions of several variables-Partial derivatives, chain rule, chain
differentiation, implicit functions and Jacobians

4 (Aug 16) Taylor's theorem for functions of several variables, maxima, minima and saddle points

5 (Aug 23) Multiple integrals

6 (Aug 30) Revision Summary (Aug 30) and Test 1 (Sep 1 to Sep 4)

7 Week (Sep 6) Complex Variables-Introduction, Continuity

8 (Sep 13) Complex Variables-Differentiability and analyticity

9 (Sep 20) Complex Variables-definite integrals (contour integrals-line integrals)

10 (Sep 27) Cauchy integral theorem and formula, Taylor and Laurent series, zeroes, singularities and residues

11 (Oct 4) Ordinary differential equations-ODE of first order, linear ODE of second and higher order with constant and non-constant coefficients

12 Week (Oct 11) Test 2 (Second Mid Term Week):Oct 11 to Oct 13

13 Week (Oct 18) Non-homogeneous equations, power series solutions to ODEs

14 (Oct 25) Partial differential equations-Classification of PDEs
Diffusion equation: separation of variables

15 (Nov 1) Semester Break (Application Assignment Week-Take Home)

16 (Nov 8) Course Evaluation Week: Wave equation separation of variables, vibrating string and d'Alembert's solution

13 (Nov 15) Week Fourier and Laplace transforms

14 (Nov 22) Test 3 (Final Exam Week)

Text Book

  ISBN 978-81-7319-730-7, New Delhi, India
Marks Distribution (Tentative) / Grading Policy

Test 1  20%
Test 2  20%
Test 3  30%
Quiz    20%
Take-home 10%

Take-home Policy
Each of you needs to work alone on an application and upload one application in latex and pdf files at Moodle.

Tutorials: 1 per week for each section. You need to submit it every week.

Labs None

Course Web Page:
http://courses.daiict.ac.in//course/view.php?id=167

Attendance Policy
Each of you must attend each lecture as I usually give few questions (called as type-2 questions) that you need to solve by that week only and clear your doubts about it. Note that I usually ask them in the exams or quizzes. There could be a surprise quiz at any time in Lectures or Tutorials and sometime I may change the % of quiz for final grade to quite a lot. If for some reason beyond your control (for example you are sick) you are about to miss a lecture please send an email in advance to me that you will not be able to attend the lecture that day.

Lecture Notes
Notes are available in the lecture folder and it is advisable that you read them before coming to class this will help you to clear your doubts.

Moodle Docs for this page
You are logged in as Manish Gupta (Logout)
sc105_aut2010