

MATH 362  
COMPLEX VARIABLES  
CSULB  
SPRING 2025

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## Overview

There's something very special and a bit mysterious about two-dimensional space. Complex numbers turn out to be exactly suited for expressing this phenomenon. Taking a *geometric and visual point of view*, we'll explore the beautiful structure of the complex numbers and intriguing properties of functions with complex numbers as variables. In particular, we'll develop a *calculus* for such functions.

## Text

T. Needham, *Visual Complex Analysis*

## Coursework

### Exercises

There will be regular assignments designed for you to write up (but not submit) and for us to discuss in class.

### Exams

At about weeks 6 and 11 there will be take-home exams. You can work with a partner on these exams. Submit one paper for your group.

An in-class final will also be given. Final exam items will be taken from the assigned exercises.

## WWW

Materials related to the course (course description, assignments) will appear at

[www.csulb.edu/~scrass/teaching](http://www.csulb.edu/~scrass/teaching)

## Coarse outline

Week	Topic
1-2	Complex numbers—geometry and algebra
3-4	Introduction to functions of complex variables
5-7	Mobius transformations
8-11	Complex differentiation
12-15	Complex integration
Final exam time (19 May, 2.45-4.45)	Project presentations

## Evaluation

Take-home exams	35% each
Final exam	30%

Here's a *rough* indication of how I will assign grades. These are **minimum** standards. The actual boundaries between grades might be lower than these, but won't be higher.

85-100%	A
75-85%	B
65-75%	C
50-65%	D

To each individual part of your work I assign a mark 0-10. See below for an *indication* of what these marks mean.

10 . . . .	Clear, elegant, mathematically correct; shows depth of understanding, insight
9 . . . . .	Clear, shows understanding and some elegance and insight; mathematically correct
8 . . . . .	Mathematically correct; little elegance and insight
7 . . . . .	Mostly mathematically correct; little elegance and insight
6 . . . . .	Some significant misconceptions
5 . . . . .	Quite significant misconceptions (with honest effort, this is about as low as it goes)
0-4 . . . .	Deep misconceptions—shows little effort.

## Key to comments on marked papers

- a This needs a supporting **argument**.
- a? What's the **argument**—the line of reasoning—here?
- d **Describe** what's going on here.
- e **Explain** what you're doing here.
- h? **How** did you get this?
- i **Illustrate** what you're talking about—give an example, a picture, etc.
- p A **picture** would help here.
- s This is not a **sentence**.
- w **Wording** is awkward, confusing, etc. Meaning is unclear.
- y? **Why** is this so? What's the connection to what you've already said?
- ! Very nice. Something especially clear, insightful
- ? What this means or what you're doing is **unclear**. Where does this come from?
- X Something's wrong here—in concept or calculation.
- √ This is right—you have the idea.

## Fine Print

**Values** The CNSM is committed to providing a safe and positive learning environment and has established a zero-tolerance policy for any sexual/gender-based misconduct, including, but not limited to sexual harassment, assault, dating violence, stalking for all faculty, staff, and students.

As members of The Beach community, we practice tolerance and denounce hate and prejudice. Our classroom will strive to be a place of mutual respect where the focus is on learning and student success.

**Basic needs program** If you are having trouble affording enough food to eat, don't have a safe and reliable place to sleep, and/or experiencing an emergency or crisis we are here to help. We are the Basic Needs Program and we have emergency services and resources to assist you. To learn more about our programs and services you can visit our website at [csulb.edu/basicneeds](http://csulb.edu/basicneeds).

**Disability** Students may ask their University at any time for a reasonable accommodation. It is the faculty member's responsibility to immediately refer this student to Disabled Student Services for assistance, including a review of appropriate medical documentation. DSS will work with the faculty member to determine the appropriate accommodation.

**Withdrawal** A copy of the School of Natural Sciences withdrawal policy is available from the Department Office. Note that it's different from the University withdrawal policy and the deadlines are earlier. Deadlines to which you should pay particular attention to appear below. Withdrawals from this course will be allowed only in accordance with University and College policies. Please be aware of the more specific and restrictive withdrawal policy for the College of Natural Sciences and Mathematics.

**Weeks 1-2.** Withdrawals will not appear on the student's permanent record.

**Weeks 3-8.** Withdrawals are permissible only for serious and compelling reasons. Academic progress unsatisfactory to the student is considered a serious and compelling reason during this period. Instructor and Department Chair signatures on the drop form are required.

**Weeks 9-12.** Withdrawals are permissible for serious and compelling reasons, but during this period, unsatisfactory academic progress is not considered a serious and compelling basis to drop a course. Circumstances must be shown that preclude the student from attending class or from any effective opportunities to study. In addition to the normal withdrawal form, a special form must be completed, and instructor and department chair signatures are required.

**Weeks 13-15.** Withdrawals are permissible only for serious accident or illness and involve a total withdrawal from the University. Detailed written documentation must accompany withdrawal forms. Instructor, chair, and college dean signatures are required.

**Cheating/Plagiarism** Cheating and plagiarism are in violation of the California Administrative Code, Title 5, Section 41301. CSULB has adopted a specific policy with respect to the violations of this nature (see the Bulletin or Schedule of Classes). Any student in violation of this code and policy in any assignment or examination related to this course shall be subject to the options specified in the policy statement. This may result in the student receiving a failing grade in the course or, in certain circumstances, being expelled from the University.