# MATH 271, Calendar
Fall 2021

**Color coding:**

- **Reading assignments to be done before class on the scheduled day.**
- **Quizzes or exams set to take place on those days.**
- **Assignments due on these days.**
- **No class on this day.**

| Monday | Tuesday | Wednesday | Friday |
|---|---|---|---|
| Aug 23rd **1**<br>• First day. Syllabus and course material.<br>• Complex numbers.<br>• **Review Chapter 1.**<br>• **Chapter 3 Sections 1, 2.** | 24th **2**<br>• Geometry of $\mathbb{C}$ and polar coordinates.<br>• **Chapter 3 Sections 3, 4.** | 25th **3**<br>• Polar coordinates and periodicity.<br>• **Chapter 3 Sections 4, 5.** | 27th **4**<br>• Intro to ODEs.<br>• **Chapter 4 Section 1, 2.**<br>• **Homework 0 due.**<br>• **Discussion due: A mathematician's lament.** |
| 30th **5**<br>• General and particular solutions. Separable ODEs.<br>• **Chapter 4 Sections 3, 4.** | 31st **6**<br>• Changing variables and qualitative analysis.<br>• **Chapter 4 Section 5, 6.** | Sep 1st **7**<br>• Open. | 3rd **8**<br>• **Quiz 1.**<br>• **Homework 1 due.**<br>• **Discussion due: The Mandelbrot and Julia Sets.**<br>• **Review due: Homework 0.** |

| Monday | Tuesday | Wednesday | Friday |
|---|---|---|---|
| 6th<br>**Labor Day** | 7th **9**<br>• First order linear equations and integrating factor.<br>• **Chapter 4 Section 7.** | 8th **10**<br>• Chemical kinetics.<br>• **Chapter 4 Section 8.** | 10th **11**<br>• Second order ODEs and initial value problems.<br>• **Chapter 4 Section 9.**<br>• **Homework 2 due.**<br>• **Discussion due: Is Mathematics Invented or Discovered?**<br>• **Review due: Homework 1.** |
| 13th **12**<br>• Continue.<br>• **Chapter 4 Section 9.** | 14th **13**<br>• Damped and driven oscillation.<br>• **Chapter 4 Section 9.** | 15th **14**<br>• Boundary value problems.<br>• **Chapter 5 Section 1.** | 17th **15**<br>• **Quiz 2**<br>• **Homework 3 due.**<br>• **Discussion due: TBD.**<br>• **Review due: Homework 2.** |
| 20th **16**<br>• Understanding the Schrödinger equation.<br>• **Chapter 5 Section 2.** | 21st **17**<br>• More on the Schrödinger equation.<br>• **Chapter 5 Section 2.** | 22nd **18**<br>• **Exam 1.**<br>• **Review due: Homework 3.** | 24th **19**<br>• **Exam 1.** |
| 27th **20**<br>• Sequences and series.<br>• **Chapter 6 Section 1, 2.** | 28th **21**<br>• Series and convergence.<br>• **Chapter 6 Section 2.** | 29th **22**<br>• Power series and radius of convergence.<br>• **Chapter 7 Section 1.** | Oct 1st **23**<br>• Continue.<br>• **Chapter 7 Section 1.**<br>• **Homework 4 due.**<br>• **Discussion due: TBD.** |

| Monday | Tuesday | Wednesday | Friday |
|---|---|---|---|
| 4th **24**<br>• Integration and differentiation with power series.<br>• **Chapter 7 Section 2.** | 5th **25**<br>• Taylor series.<br>• **Chapter 7 Section 3.** | 6th **26**<br>• Approximation with Taylor series and Morse potential.<br>• **Chapter 7 Section 4.** | 8th **27**<br>• **Quiz 3.**<br>• **Homework 5 due.**<br>• **Discussion due: TBD.**<br>• **Review due: Homework 4.** |
| 11th **28**<br>• Series solutions to ODEs.<br>• **Chapter 7 Section 5.** | 12th **29**<br>• Continue. | 13th **30**<br>• Special polynomials.<br>• **Chapter 7 Section 6.** | 15th **31**<br>• Quantum harmonic oscillator.<br>• **Chapter 7 Section 7.**<br>• **Homework 6 due.**<br>• **Discussion due: TBD.**<br>• **Review due: Homework 5.** |
| 18th **32**<br>• Continue. | 19th **33**<br>• Open. | 20th **34**<br>• **Oral Exam 2.**<br>• **Review due: Homework 6.** | 22nd **35**<br>• **Oral Exam 2.** |
| 25th **36**<br>• Vectors and vector spaces.<br>• **Chapter 8 Sections 1, 2.** | 26th **37**<br>• Algebra of vector spaces.<br>• **Chapter 8 Section 3, 4.** | 27th **38**<br>• Inner and cross products.<br>• **Chapter 8 Section 5.** | 29th **39**<br>• Linear transformations and matrices.<br>• **Chapter 9 Section 1.**<br>• **Homework 7 due.**<br>• **Discussion due: TBD.** |

| Monday | Tuesday | Wednesday | Friday |
|---|---|---|---|
| Nov 1st **40**<br>• Continue. | 2nd **41**<br>• Matrix algebra.<br>• **Chapter 9 Section 2.** | 3rd **42**<br>• Systems of inhomogeneous linear equations.<br>• **Chapter 9 Section 3, 4.** | 5th **43**<br>• Systems of homogeneous equations, nullspace.<br>• **Chapter 9 Section 3, 4.**<br>• **Homework 8 due.**<br>• **Discussion due: TBD.**<br>• **Review due: Homework 7.** |
| 8th **44**<br>• Linear independence, span, and bases.<br>• **Chapter 9 Section 5.** | 9th **45**<br>• Determinants, traces, and their properties.<br>• **Chapter 9 Section 6.** | 10th **46**<br>• Continue. | 12th **47**<br>• **Quiz 4.**<br>• **Homework 9 due.**<br>• **Discussion due: TBD.**<br>• **Review due: Homework 8.** |
| 15th **48**<br>• Inverse and similar matrices.<br>• **Chapter 9 Section 7.** | 16th **49**<br>• Eigen-problem.<br>• **Chapter 9 Section 8.** | 17th **50**<br>• Diagonalization and Hermitian matrices.<br>• **Chapter 9 Section 9.** | 19th **51**<br>• Continue.<br>• **Homework 10 due.**<br>• **Discussion due: TBD.**<br>• **Review due: Homework 9.** |
| 22nd<br>**Fall Break** | 23rd<br>**Fall Break** | 24th<br>**Fall Break** | 26th<br>**Fall Break** |

| Monday | Tuesday | Wednesday | Friday |
|---|---|---|---|
| 29th **52**<br>• Groups and symmetries.<br>• **Chapter 9 Section 10.** | 30th **53**<br>• Continue. | Dec 1st **54**<br>• Continue. | 3rd **55**<br>• **Quiz 5.**<br>• **Homework 11 due.**<br>• **Discussion due: TBD.**<br>• **Review due: Homework 10.** |
| 6th **56**<br>• Project and review. | 7th **57**<br>• Project and review. | 8th **58**<br>• **Exam 3.**<br>• **Review due: Homework 11.** | 10th **59**<br>• **Exam 3.** |