

**Math 371 Advanced Calculus**  
**Spring 2021**

**Instructor:** Dr. Kathy Temple

**Office:** Samuelson 221D

**Phone:** (509) 963-1389

**E-mail:** Kathryn.Temple@cwu.edu

**Office Hours:** MW 2 - 2:50 PM, TTh 10:00 - 10:50 AM, and by appointment.

**Meeting times:** Please plan on being on Zoom from 1 - 1:50 M - Th. After the first week, there may be an option to attend class in-person - we'll talk about this at the beginning of the quarter. In-person meeting locations, if available, will be announced in class.

**Course Goals:** The goal of this course is to approach the real numbers and calculus from an axiomatic point of view. This course also helps students develop proof-writing skills that are necessary for more advanced mathematics. Specifically, we will cover:

- Number systems (naturals, integers, rationals, and reals): axioms and properties
- Sequences and series of real numbers
- Continuity

**Prerequisite:** MATH 272 and {MATH 351 or MATH 335}

**Required Text:** None; we'll be using lecture notes "An Introduction to Analysis on  $\mathbb{R}$ ," written by Dr. Bisgard. These notes will be posted on Canvas.

**Evaluation:**

- Three oral exams (focusing on definitions and concepts): Tuesday, April 20 (5%); Tuesday, May 11 (10%); and during finals week on Thursday, June 10 (10%);
- Take-home midterm exam, tentatively given the week of May 4-7 (10%);
- Take-home final exam, due on Thursday, June 10 (15%);
- Homework (50%).

Course grades will be assigned based upon the following scale:

93-100%=A	90-92.9%=A-	87-89.9%=B+	83-86.9%=B	80-82.9%=B-
77-79.9%=C+	73-76.9%=C	70-72.9%=C-	67-69.9%=D+	63-66.9%=D
60-62.9%=D-	below 60%=F			

**Course Components:**

- **Homework:** Weekly homework will be assigned in class, typically due on Fridays. You will be given about one week to complete a regular assignment. You will also be asked to turn in outlines of some selected problems a few days before the actual assignment is due, typically on Tuesdays. A separate handout will describe what is required in a proof outline. Homework must be done neatly, legibly, and submitted according to the guidelines for written work below. Your work should be in a logical order, provide sufficient explanation, and use complete sentences where appropriate. You may use/ask/talk to whatever/whoever

you'd like, as long as you say what resources you used or who you worked with. *However*, you must write your solutions up in your own words to hand in. Credit will not be given to any party for work that is identical!

Since there's always an element of adapting to a new instructor, up through the take-home midterm you will be able to do revisions on homework assignments. Revisions will be due on the Thursday after the homework assignment was originally due, and can earn up to two points per problem (out of 10). Revisions must be done as a new document. There will be no revisions on homework sets due after the take-home midterm.

- **Oral Exams:** We'll do three oral "exams" (definition and concept checks) during the quarter. The dates are given above. For each exam, plan to allow 20 minutes. The exams will focus on definitions, concepts, and examples; more detail will be given before the first one. *For these exams, you will need to have a clear workspace. These are closed-book, with no notes, text, or other resources are allowed.* You may have blank paper and, of course, computer/tablet/phone for those doing the exam on Zoom. You will want to have a way to be able to write so that I can see it. Some options include:
  - If you have a drawing tablet or stylus, we can use that along with the whiteboard in Zoom.
  - You can use your phone as an improvised document camera. There are lots of ideas for this online; many people have made stands out of books or a cardboard box with a cutout for the camera. You can write on a small whiteboard or blank paper (if using paper, I suggest using a thick, dark pen or a marker).
  - If public health conditions permit and you would prefer, we can do the exam in-person. We'll grab a classroom or conference room and you can write on the whiteboard.

You'll need to start the exam by giving me a brief tour of your workspace. You are required to share your screen when asked.

- **Take-home Exams:** Take-home exams, like homework assignments, must be submitted according to the guidelines for written work for the course. For take-home exams, *you may not discuss the exam with anyone (besides me) or use outside resources.* There will be a take-home midterm and a take-home final; tentative dates are given above.

**General Course Policies:** Come to class. Do your own work. Work really hard; this is not going to be an easy course, but you will leave it with a better understanding of analytic ideas, and stronger proof-writing skills!

**Face Coverings and Social Distancing:** Due to COVID-19, and under the directive and mandate of public health officials and the president of Central Washington University, students must adopt face covering protocol before entering any classroom or building at CWU until further notice. Students must also follow the social distancing placement marks in buildings and classrooms. If you do not have a face covering Central Washington University can provide one for you. If you have not yet received your CWU-supplied facial covering, please go the SURC Information Desk. Please do so prior to the start of your first class. Face coverings must cover both the mouth and nose. Your mask protects me; my mask protects you. Masks with one-way valves for exhalation don't have the protective value for others - please don't use them as your face covering for any in-person components. Thank you for helping keep all of us safe!

**Class Recordings:** Lecture/discussion will be recorded and posted on Canvas for those who can't attend synchronously on a given day. Please plan on attending synchronously on an ongoing

basis, however. We all benefit from the conversations in-class, and they will be richer for having you there! Also, please note that work done in breakout rooms will *not* be recorded.

If you are attending virtually, please turn on your camera if that is reasonable given your situation, bandwidth issues, etc. If you cannot turn on your camera, please use a profile picture on Zoom that matches your profile picture on Canvas (and please put one up on Canvas) so that we don't have to look at a sea of names/initials!

**Written Work:** All work turned in for the course must be written neatly, legibly, clearly, using correct mathematical notation, and with sufficient explanation. Complete sentences should be used where appropriate. All work must be double-spaced.

**Late Work:** Late homework assignments can be submitted with a 20% penalty per 24-hour period, up until the time that graded work is returned to the rest of the class. Homework submitted after graded work is returned to the rest of the class will not receive credit, however, the lowest homework score will be dropped. If you have extenuating circumstances around the midterm or final, I encourage you to communicate with me as soon as possible; see the section on communication, below.

**Submitting Work Electronically:** All work for this course will be submitted electronically through Canvas. *All work, regardless of whether it is typeset or hand-written, must be double-spaced.*

- If you choose to type your work, your file submission should be in .pdf format only. All typesetting must be done using correct symbols and mathematical notation; I strongly suggest using L<sup>A</sup>T<sub>E</sub>X(or one of the T<sub>E</sub>Xvariants).
- If you choose to hand-write your work, you have a couple of options for submission:
  - You can scan it to a PDF document using a cell phone camera. Some apps that do this (there are many others if you don't like these): Adobe (free) or CamScanner (free version) for Android phones; the Notes App (built-in) or CamScanner(free version) for iPhone.
  - You can take a well-lit, easy-to-read photograph, insert it into a Microsoft Word or OpenOffice Writer document, make sure that the photo is oriented correctly and easy to read, and then save the document as a .pdf file for upload to Canvas.
  - For any handwritten work, if your work is multiple pages, please upload as a SINGLE file.

Whichever method you choose, please double-check that your image is oriented correctly. Images not oriented correctly or images that are not easy to read will lead to the assignment being returned without being graded.

**Academic Honesty:** Consult university policies (CWUP 5-90-040(22), CWUR 2-90-040(22), and WAC 106-125-020) for student conduct, cheating, plagiarism, and other academic expectations. CWU's policies and recommendations for academic misconduct will be followed, leading to disciplinary action up to and including failing the course.

**Inclusivity Statement:** As a member of a peer learning community, a high degree of professionalism is necessary. **CWU expects every member of the university community to contribute to an inclusive and respectful classroom culture.**

**Classroom Conduct:** Students in this class are expected to interact with students and the professor professionally. Instances of disruptive conduct, obstructive conduct, or harassment (see definitions below from the Washington Administrative Code: WAC 106-125-020) will be referred to the Dean of Student Success.

**Disability Support Services:** Central Washington University is committed to creating a learning environment that meets the needs of its diverse student body. Students with disabilities should contact Disability Services to discuss a range of options to removing barriers, including accommodations: Hogue Hall 126, 509.963.2214, DS@cwu.edu

**Is my absence excused?** Excused absences will not lower your overall grade in this class and are determined on a case-by-case basis. Excused absences include illness, bereavement, and school-related activities. With the exception of illness, documentation is required. Excused absences do not include travel for holiday breaks, work, or non-emergency travel delays. In compliance with RCW 28B.137.010, Central Washington University makes every effort to deal reasonably and fairly with students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Students must present written notice to their instructor within the first two weeks of class listing the specific dates on which accommodations are required. Contact the Dean of Student Success at (509) 963-1515 for further information or questions.

**Communication:** This is going to be an unusual quarter in many ways. Some of you are completely remote. Some of us may need to quarantine in the middle of the quarter. Even if you are attending some course meetings in person, we all may need to shift entirely remote on short notice (and it may be worth thinking in advance about how you would make that work, both in terms of technology and in terms of being able to attend class and complete work remotely). In all things, communication is going to be key. If you have something going on, please let me know (no details you don't feel comfortable sharing, of course, just a general heads-up). As things need to change during the quarter, I will do my best to let you know as soon as I can. In all things, please extend grace to me and your classmates, and I will do my best to do the same.

I reserve the right to change the policies contained in this syllabus as dictated by developments during the quarter.

#### **Advice from Past 371 Students:**

- Go to office hours! I think I would've saved myself a lot of late nights and confusion if I had gone to office hours to ask clarifying questions/get help on homework problems.
- Go to office hours when you are stuck and/or confused. Make note cards and attempt every problem.
- The lectures are useful, go to them and take notes (and don't let your life go absolutely crazy on the side).
- Go to [instructors] office if you have any questions about the homework/class notes.
- Study definitions and theorems! Understanding these will be so helpful on the tests and homework. Even if you don't fully understand how to do a proof knowing the definitions and theorems will get you pretty far!
- Start thinking about how everything relates throughout the quarter.
- There is a lot of definition/theorem chasing, it would be wise to have them all in a specific spot so you are not playing fetch every assignment.
- Good luck :)