湖北工業大學
HUBEI UNIVERSITY OF TECHNOLOGY

Course Title	Introductory Real Analysis
Course Code	MATH 3370
Semester	Fall 2026
Course Length	5 Weeks, 60 Contact Hours
Credits	4
Instructor	TBA
Office	TBA
Email	TBA
Prerequisite	MATH 1111 Calculus I & MATH 1112 Calculus II

Course Description:

This course helps you go through the introduction of (undergraduate) real analysis. Topics include real number systems; sequences and series; limit, continuity, and differentiation; the Riemann integral; sequences and series of functions; elementary metric space theory including compactness, connectedness, and completeness; differentiation, and integration of functions of several variables.

Course Goals:

Students who successfully complete this course will demonstrate competency in the following general education core goals:

- **Critical Thinking Skills** – Students will engage in analytical thinking, demonstrating the ability to critically evaluate, synthesize, and apply knowledge to complex problems, and construct well-reasoned solutions and arguments.
- **Independent Research and Inquiry** – Students will conduct independent research, utilizing academic resources to explore relevant topics, formulating research questions, analyzing data, and presenting findings in a coherent, scholarly manner.
- **Problem-Solving and Application** – Students will apply theoretical concepts and methodologies learned in the course to real-world problems, demonstrating the ability to develop practical solutions informed by academic inquiry.
- **Global and Cultural Awareness** – Students will gain awareness of the global and cultural contexts relevant to the course, appreciating diverse perspectives and considering the implications of their studies in a broader, international context.

Student Learning Outcomes:

Upon completion of this course, students will be able to:

- state precisely the definition of a limit and use this definition to determine and justify where functions are continuous, differentiable, etc.;
- understand the error term in Taylor's Theorem;
- work with a precise definition of Riemann integrability;
- grasp some basic concepts about metric spaces and some of the unusual subsets of the real numbers.

Textbooks/Supplies/Materials/Equipment/ Technology or Technical Requirements:
Bartle & Sherbert, *Introduction to Real Analysis*, Wiley, fourth edition.

Course Requirements:

Class Attendance
Full credit for attendance will be given to students with three or fewer unexcused absences. Four or more absences will result in a proportional reduction of the grade.

Homework Assignments
The homework assignments will cover problems from the chapters we covered in the previous weeks. There will be a total of 8 assignments and the best 6 will count toward your grade.

Exams
There will be one midterm and one final exam in this class. Exams will typically feature multi-part questions, definition statements, working with key concepts, and writing proofs. No calculators or other electronic devices will be allowed, and having such a device in view during the exam is an academic honesty violation.

Assessments: Activity	**Percent Contribution**
Class Attendance	10%
Homework Assignments	30%
Midterm Exam	25%
Final Exam	35%

Grading:

Final grades will be based on the sum of all possible course points as noted above.

Grade	**Percentage of available points**
A	94-100
A-	90-93
B+	87-89
B	84-86
B-	80-83
C+	77-79
C	74-76
C-	70-73
D	64-69
D-	60-63
F	0-59

Course Schedule:
The schedule of activities is subject to change at the reasonable discretion of the instructor. Minor changes will be announced in class, major ones provided in writing.

	MATH 3370 Schedule	
Lecture	Topic	Readings
L1	Course Introduction, Syllabus Overview Sets and Functions Finite and Infinite Sets	Chapter 1
L2	The Real Numbers The Algebraic and Order Properties of R	Chapter 2
L3	The Completeness Property of R	Chapter 2
L4	Sequences and Series Sequences and Their Limits Limit Theorems **HW1 due**	Chapter 3
L5	Subsequences and the Bolzano-Weierstrass Theorem	Chapter 3
L6	The Cauchy Criterion Introduction to Infinite Series	Chapter 3
L7	Limits Limits of Functions **HW2 due**	Chapter 4
L8	Some Extensions of the Limit Concept	Chapter 4
L9	Continuous Functions Continuous Functions on Intervals	Chapter 5
L10	Uniform Continuity Monotone and Inverse Functions **HW3 due**	Chapter 5
L11	**Midterm Exam**	--
L12	Differentiation The Derivative	Chapter 6
L13	The Mean Value Theorem	Chapter 6
L14	L'Hospital's Rules Taylor's Theorem **HW4 due**	Chapter 6
L15	The Riemann Integral Riemann Integrable Functions The Fundamental Theorem	Chapter 7
L16	The Darboux Integral Approximate Integration	Chapter 7
L17	Sequences of Functions Pointwise and Uniform Convergence Interchange of Limits **HW5 due**	Chapter 8
L18	The Exponential and Logarithmic Functions The Trigonometric Functions	Chapter 8
L19	Infinite Series Absolute Convergence Tests for Absolute Convergence	Chapter 9
L20	Tests for Nonabsolute Convergence Series of Functions **HW6 due**	Chapter 9

L21	The Generalized Riemann Integral Definition and Main Properties	Chapter 10
L22	Improper and Lebesgue Integrals Infinite Intervals Convergence Theorems **HW7 due**	Chapter 10
L23	Open and Closed Sets in R	Chapter 11
L24	Compact Sets Continuous Functions **HW8 due**	Chapter 11
L25	Metric Spaces **Final Exam**	Chapter 11 --

Accommodation Statement:

Academic accommodations may be made for any student who notifies the instructor of the need for an accommodation. It is imperative that you take the initiative to bring such needs to the instructor's attention, as he/she is not legally permitted to inquire. Students who may require assistance in emergency evacuations should contact the instructor regarding the most appropriate procedures to follow.

Academic Integrity Statement

Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty or otherwise fails to meet the standards. Any student judged to have engaged in academic dishonesty in coursework may receive a reduced or failing grade for the work in question and/or for the course.

Academic dishonesty includes, but is not limited to, dishonesty in quizzes, tests, or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.

Other Items:

Attendance and Expectations

All students are required to attend every class, except in cases of illness, serious family concerns, or other major problems. We expect that students will arrive on time, be prepared to listen and participate as appropriate, and stay for the duration of a meeting rather than drift in or out casually. In short, we anticipate that students will show professors and fellow students maximum consideration by minimizing the disturbances that cause interruptions in the learning process. This means that punctuality is a must, that cellular phones be turned off, and that courtesy is the guiding principle in all exchanges among students and faculty. You will be responsible for the materials and ideas presented in the lecture.

Assignment Due Dates

All written assignments must be turned in at the time specified. Late assignments will not be accepted unless prior information has been obtained from the instructor. If you believe you have extenuating circumstances, please contact the instructor as soon as possible.

Make-Up Work

The instructor will not provide students with class information or make-up assignments/quizzes/exams missed due to an unexcused absence. Absences will be excused and assignments/quizzes/exams may be made up only with written documentation of an authorized absence. Every effort should be made to avoid scheduling appointments during class. An excused student is responsible for requesting any missed information from the instructor and setting up any necessary appointments outside of class.

Access, Special Needs, and Disabilities

Please notify the instructor at the start of the semester if you have any documented disabilities, a medical issue, or any special circumstances that require attention, and the school will be happy to assist.