Math1230A 570
Calculus for Social Sciences
Fall 2026

Instructor: Ram Valluri, PhD
Email: valluri@uwo.ca

Course Information

Mode of Instruction: In-Person

Calendar Description:

Review of differential calculus with transcendental functions; methods of integration; constrained and unconstrained multivariable optimization, with applications; mathematical modelling with differential equations, including applications in management, finance, economics, and social science.

Pre-requisite(s): One or more of Ontario Secondary School MCV4U, Mathematics 0110A/B.

Anti-requisite(s): Applied Mathematics 1201A/B, Calculus 1000A/B, Calculus 1301A/B, Calculus 1500A/B, Calculus 1501A/B, Mathematics 1225A/B, Numerical and Mathematical Methods 1412A/B, Numerical and Mathematical Methods 1414A/B, the former Applied Mathematics 1412A/B, the former Applied Mathematics 1413, the former Applied Mathematics 1414A/B.

Extra Information: 4 lecture hours.

Course Weight: 0.50
Breadth: Category C
Subject Code: MATH

Notice: Unless you have either the requisites for this course (fulfilment of pre-requisites, no anti-requisite conflicts), or special permission from your Dean to enrol in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

WESTERN UNIVERSITY
SCHOOL OF MANAGEMENT, ECONOMICS, AND MATHEMATICS at KING'S

Mathematics 1230A

Calculus for Management, Economics, Finance and Social Science

September - December 2026

INSTRUCTOR INFORMATION

Section	Instructor	Email
570	S. Valluri	valluri@uwo.ca

DROP-IN/OFFICE HOURS
Posted to Brightspace

ALL DATES AND TIMES HIGHLIGHTED ARE SUBJECT TO CHANGE

MANDATORY WORKBOOK
Workbook for Math 1230A/B

- Free: print on your own (pdf file(s) posted to OWL)
- Available in print format from Central Services (Wemple building, near cafeteria) for $40
- Ignore any reference to year – the booklet is unchanged from prior years

OPTIONAL TEXTBOOK
Custom Text for Mathematics 0110A/B, 1225A/B and 1230A/B
Comes in print and e-book formats, with homework solutions book (*any edition is fine).* Available free on OWL

CLASS FORMAT

- Lectures are real-time, in-person:

Wednesday & Friday 8:30 AM EST – 10:30 AM EST KC-LH101

- Tests and exams are in person

TECHNOLOGY REQUIREMENTS

- Computer access (personal computer, personal laptop, or campus computer)
- Webcam and microphone (if we need to go online temporarily, e.g. zombie geese apocalypse)
- High-speed internet access

PREREQUISITES
MCV4U, high school calculus, or Mathematics 0110A/B.

THIS MEANS YOU MUST HAVE TAKEN A PRIOR COURSE IN CALCULUS!!!!!!

ANTIREQUISITES
Applied Mathematics 1201A/B, Applied Mathematics 1412A/B, Applied Mathematics 1414A/B, Calculus 1000A/B, Calculus 1301A/B, Calculus 1500A/B, Calculus 1501A/B, Mathematics 1225A/B, the former Applied Mathematics 1413.

COURSE TOPICS
Review of differential calculus with transcendental functions; methods of integration; constrained and unconstrained multivariable optimization, with applications; mathematical modelling with differential equations, including applications in management, finance, economics, and social science.

LEARNING OUTCOMES

- Apply exponential and log functions to solve problems
- Use differential calculus to find rates of change and tangent lines
- Use multivariable calculus to perform constrained and unconstrained optimization
- Learn about summations and index notation, including geometric series
- Learn integral calculus and apply integrals to find to averages and areas under curves
- Solve first-order differential equations
- Create and solve models for population and finance problems

*Previous versions of the course included coverage of trigonometry. This topic has been removed in mathematics 1230A/B, and replaced with coverage of summations and index

INSTRUCTOR CONTACT INSTRUCTIONS:
The best way to contact your instructor is in class or at so-called "office hours". What are office hours? See this wonderful explanation from Dr. Ishak at Santa Clara University: https://vimeo.com/270014784.

- See the drop-in hours on the course OWL page
- Email is not efficient
    - response times vary wildly depending on email volume
    - instructors may be receiving hundreds of emails per day
    - An email sent to an instructor **SHOULD say *Math 1230A* in the subject line**. This helps categorize your email as "not spam" and give it a higher priority
    - Do not trust email "autocomplete" to default to your instructor's email addresses. Type it in. Autocomplete may automatically input the wrong email address.
- Email should not be your primary means of communication with instructors

Your mark in the course will be the mark that you earn based on your demonstrated understanding of the course content, assessed using the outlined criteria.

EVALUATION OF STUDENT LEARNING:

Name of Assessment	Date	Weight
Quiz 0 (Review quiz)	Infinite attempts Opens: Wednesday, September 9, 2026 Closes: Saturday, September 26, 2026 NO EXTENSIONS	5%
Quiz 1 (in class)	During class, Oct 15 from 8:30-9:30 AM	5%
Test 1	Friday, October 17 from 5:00-7:00 PM (2 hours) Locations to be determined.	20%
Quiz 2 (in class)	During class, November 12 from 8:30-9:30 AM	5%
Test 2	Friday, November 14 from 5:00-7:00 PM (2 hours) Locations to be determined.	20%
Quiz 3	During class, TBA	5%
Flex Grade	Automatically calculated at end of course 5% weight applied to your best of test 1, test 2, or exam	5%
Final Exam	December Exam Period (3 hours) Locations to be determined.	35%

Makeup dates for test 1 and test 2 are indicated in the "POLICIES" section of this course outline.

FORMAT OF IN-PERSON TESTS, IN-CLASS-QUIZZES, AND FINAL EXAM

- Expect a mix of multiple choice and long answer questions
- Bring one formula sheet with anything you want, handwritten on both sides.
    - See complete formula sheet policy on the next page
- You can prepare for the questions on quizzes, tests, and exams by completing the worksheets (especially the questions that are more "standard-looking")

REVIEW QUIZ INFORMATION

- The **Review Quiz** covers introductory functions and calculus material, including:
    - **Functions**: Factoring, expanding, collecting like terms, re-arranging, exponent laws, roots, fractions, lines, exponential and log functions properties, solving for x using exponential and log cancellation laws, etc.
    - **Introductory Calculus**: Power rule, product rule, quotient rule, chain rule, optimization (finding max and min) of one-variable functions
- It is held online, is open-book, and you can complete it as many times as you want until the deadline.
- There are no extensions for any reason, as it will be open for over 2 weeks.
- This is only 5% of the course grade – the other 95% of the course grade will depend on you knowing this material in the review quiz. It is to your benefit to complete the quiz properly (using your own brain) and seek help to understand it, not just fake an understanding of it to get the 5%.

FORMULA SHEET POLICY (for in-person tests, quizzes, and exam)

The tests, final exam, and quizzes allow you to bring a formula sheet.

- You may bring 1 page of formulas and examples, written on the front and back.
- It must be submitted with your tests and exam, and will be returned to you
- Your name must be on it!!
- The formula sheet must be HAND-WRITTEN. Thus, unless you have a physical disability that precludes any ability to write, typed formula sheets are not permitted. It is also OK if you handwrite it on a device (e.g. tablet with a pen) and then print it, but it must be your handwriting in that case. Our aim is for students to create their own formula sheet, because the real point of allowing the formula sheets is to encourage you to spend time making one, which requires reviewing the material, figuring out what is important, hunting for important examples, and doing all the things that will result in learning.
- You cannot share your sheet during the tests or exam – it is for your eyes only
- Open-note format is dangerous because it invites you to run out of time. If you don't understand what is on your sheet, it will basically be useless to you.

APPROXIMATE SCHEDULE OF TOPICS

- Each instructor will have small differences from the below approximate schedule.

	Topics Covered (tentative schedule, approximately one class per unit)
UNIT 1	Review: Functions, expanding, factoring, solving for x, etc
UNIT 2	Review: exponential and log functions
UNIT 3	Review: derivative rules
UNIT 4	Review: Optimization - single-variable functions
UNIT 5	Multivariable functions, partial derivatives
UNIT 6	Second partial derivatives
UNIT 7	Multivariable optimization without constraints
UNIT 8	Multivariable optimization with single constraint
UNIT 9	Summations, index notation
UNIT 10	Antiderivatives, indefinite integrals
UNIT 11	Definite integrals
UNIT 12	Method of substitution
UNIT 13	Properties of integrals, PW functions
UNIT 14	Area between curves
UNIT 15	Average value
UNIT 16	Improper integrals
UNIT 17	Integration by parts
UNIT 18	Separable differential equations
UNIT 29	Linear first order differential equations
UNIT 20	Applications of differential equations (population, etc)
UNIT 21	Finance applications of differential equations

POLICIES

Appropriate Use of Learning Environment

- The course web site is hosted on Brightspace. It requires login using your UWO credentials.
- Course materials on the Brightspace page including notes, videos, and related are copyright-protected by the instructors and cannot be distributed.
- Uploading of any course materials to websites or social media is strictly forbidden and will result in punishment (ranging from informal warnings, formal warnings, deduction of grades, removal from the course, or expulsion from the university, depending on the severity of the violation)
- Class activities may not be recorded (video or audio) by students. This is to protect the privacy of everyone in attendance. Full video lessons and full notes will be available.

Academic Integrity

- It is expected that all work you submit will be your own.
- Academic integrity policies at Western require that instructors forward to their Department Chair, Associate Director, Director, and/or Associate Dean Academic any evidence of academic offenses
- Cheating is taken seriously to protect the integrity of our measures of your learning
- Students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

- Tests, quizzes, and exams may be subject to similarity review (by hand or by software) to check for unusual coincidences in answer patterns that may indicate cheating.
- Instructors reserve the right to ask questions of students about any submitted work, and revise grades **downward** according to the inability of the student to explain what they submitted.

Makeup Tests

- Makeup tests will be held for students approved to write a makeup due to academic conflict or confirmed medical issue or on confirmed compassionate grounds. Birthdays, social activities, family trips, vacations, concerts, etc. are not grounds for a makeup.
- **Makeup for Test 1: Friday, October 24 from 2:30-4:30 PM in SA 150/151**
- **Makeup for Test 2: Friday, November 21 from 2:30-4:30 PM in SA 150/151**
- If students approved to write a makeup test miss the makeup test without academic consideration from the dean's office, their test grade will be 0. With formal academic consideration to miss the test **and** the makeup test, the test grade will be weighted to the final exam.

Missed Quizzes

- There are no makeup quizzes.
- If you miss quiz 0 (the online review quiz) for any reason, your grade on it is zero. It is open for over 2 weeks. There is no excuse to not complete it during that time.
- If you miss quiz 1, quiz 2, or quiz 3:
    - If you inform the instructor that you will miss the quiz before the day and START TIME of the quiz, your quiz grade will be automatically reweighted to test 1 (for quiz 1), test 2 (for quiz 2) or the final exam (for quiz 3). We don't need a good reason – just tell us ahead of time that you will be missing. This is part of learning basic professionalism.
    - If you do not inform the instructor before the start time of quiz that you will miss it, and if you do not provide the dean's office with documentation to obtain formal academic consideration to excuse not just your absence but also your lack of communication with the instructor, your missed quiz grade will be zero.

COMMENTS ON LEARNING MATHEMATICS

There are many reasons to learn math. Here are three good reasons.

1. It is a language and set of structures that allow us to efficiently discuss, model, and explain reality. So, for some people, learning mathematics is about being able to perform specific operations and procedures for applications. People heading to professional routes that use mathematics (engineering, computer science, economics, finance, physics, actuarial science, etc.) can justify the effort needed in terms of direct utility. This concept of mathematics also aligns with its placement in the sciences, especially as it relates to developments in applied mathematics, statistics, data science, theoretical physics, and astrophysics. In recent years, mathematics increasingly encroaches in the managerial and social sciences as well, especially economics, business, analytics, finance, and quantitative-subdisciplines within psychology and sociology.

2. It provides a form of intellectual exercise that enhances our ability to solve (mathematical *and* non-mathematical) problems, think creatively, argue concisely, and navigate challenges that may not in any superficial way resemble mathematics. It provides intellectual exercise akin to exercises performed as training for a sport. With physical training, there may be resentment toward running laps or lifting weights because the connection to playing soccer or basketball may be harder to see than, say, dribbling or passing drills that are specific to the sport. It is no different with mathematical training; laments about "inapplicability" of mathematics to life or to a particular career are missing that mathematical training supports intellectual fitness.

3. Mathematics pursues truths that are independent of any direct or indirect utility. For example, a formally proven mathematical theorem is a forever-concluded matter (i.e., not subject to scientific revision or sociopolitical reimagination), and few other areas of human inquiry enjoy this feature. The pursuit of truth and even beauty within mathematics is why mathematics can also be thought of as an art - a very precise one.

KING'S UNIVERSITY COLLEGE
GENERAL COURSE POLICIES
2026-2027

1. Academic Accommodations, Consideration for Absences

Academic Accommodation (Accessibility)

Accessibility Services works to ensure that academic programs are accessible to all students, and supports students who may have a condition related to, but not limited to, vision, hearing, mobility, different ways of learning, mental health, chronic illnesses, chronic pain, autism spectrum disorder, ADD/ADHD, and temporary conditions (beyond short-term academic consideration). Accessibility Services provides recommendations for accommodation based on medical documentation or psychological and cognitive assessment. The accommodation policy can be found here Academic Accommodation for Students with Disabilities. Information on Accessibility Services at King's can be found here.

Academic Consideration for Student Absence

If a student is unable to meet a course requirement due to substantial but temporary extenuating circumstances (medical or compassionate), they should follow the procedures below.

In some cases, where instructors have built flexibility into their assessments, this flexibility will already address consideration needs.

Requests for academic consideration should be directed to the Academic Advising Office of your faculty/college of registration. Requests must be made as soon as possible and no later than 48 hours after the missed assessment.

As a rule, documentation is required for academic consideration. For academic consideration requests on medical grounds, the Student Medical Certificate is available at https://registrar.uwo.ca/academics/pdfs/student-medical-certificate.pdf

Students are permitted one academic consideration request without supporting documentation per term per course.

Instructors may designate one assessment per half-course weight as requiring formal supporting documentation. Please refer to the course outline for each course.

For further information, please see:
https://uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf

Absences from Final Examinations

If you miss the Final Exam, contact the Academic Advising Office of your faculty/college of registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, or more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

Religious Accommodation

Students should consult the University's list of recognized religious holidays, and should give notice in writing to the instructor and Academic Advising Office if a course requirement will be affected by a religious holiday/observance. Notice must be given as early as possible, and no later than two weeks prior to an examination, and one week prior to a midterm test date. It is the responsibility of such students to inform themselves concerning the work done in classes from which they are absent and to take appropriate action.

2. Support Services

Accessibility, Counselling and Student Development at King's University College: https://kings.uwo.ca/community/library/services/accessibility/

Students experiencing emotional or mental health distress can access services at King's University College: https://kings.uwo.ca/campus-life/student-supports/

Good2talk is a good online and phone 24/7 resource for students and is available in English, Mandarin, and French: https://good2talk.ca, 1-866-925-5454

MentalHealth@Western provides a complete list of options about how to obtain help: https://www.uwo.ca/health/mental-health/index.html

Academic Support Services at King's University College: https://www.kings.uwo.ca/current-students/academic-resources/

GBSV Support:

King's (Western) is committed to reducing incidents of gender-based sexual violence (GBSV) and providing compassionate support to anyone who is going through or has gone through these traumatic events. If you are experiencing or have experienced GBSV (either recently or in the past), you will find information about support services for survivors, including emergency contacts at the following website:

Mental Health and Wellness at King's - King's University College

You can reach someone supports at Kings by emailing Care@kings.uwo.ca or calling 519-930-4640 to reach a social worker who can offer help.

You can also reach Western's Gender-Based Violence & Survivor Support Case Manager by email or by calling 519-661-3568.

You can reach someone supports at Kings by emailing Care@kings.uwo.ca or calling 519-930-4640 to reach a social worker who can offer help.

3. Statement on Use of Electronic Devices

Use of Electronic Devices: Unless explicitly stated otherwise, you are not allowed to have a cell phone, or any other electronic device, with you during tests or examinations. Unauthorized possession of such a device during a test or examination constitutes an academic offence.

Use of Laptops, Tablets, and Smartphones in the Classroom: King's University College at Western University acknowledges the integration of new technologies and learning methods into the curriculum. The use of electronic devices such as laptop computers, tablets, or smartphones can contribute to student engagement and effective learning. At the same time, King's recognizes that instructors and students share jointly the responsibility to establish and maintain a respectful classroom environment conducive to learning.

The use of electronic devices by students during lectures, seminars, labs, etc., shall be for matters related to the course at hand only. Students found to be using electronic devices for purposes not directly related to the class may be subject to sanctions under the Student Code of Conduct; see https://kings.uwo.ca/sites/2025/assets/files/about/governance/policies/board/Board%20Policy%203_1%20Code%20of%20Student%20Responsibilities%20and%20Conduct.pdf

Inappropriate use of electronics (e.g., laptops, tablets, smartphones) during lectures, seminars, labs, etc., creates a significant disruption. As a consequence, instructors may choose to limit the use of electronic devices in these settings. In addition, in order to provide a safe classroom environment, students attending in-person class sessions are strongly advised to operate laptops with batteries rather than power cords.

4. Statement on Academic Offences

King's is committed to academic integrity. Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, is posted at
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_offences.pdf

It is expected that students will submit work that is truly their own, completed without external assistance (human or artificial) except as explicitly permitted by the course instructor. Check with you instructor on what tools, including generative AI (ChatGPT, translation tools, grammar-checking tools) are permitted in the course. Because a tool is permitted in one course, that does not mean it is permitted in other courses.

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system; see https://elearningtoolkit.uwo.ca/tools/Originality Reports - TurnItIn.html.

Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

5. Copyright of Course Material

Lectures and course materials, including PowerPoint presentations, tests, outlines, and similar materials are protected by copyright. Faculty members are the exclusive owner of copyright in those materials they create. Students may take notes and make copies for their own use. Students may not allow others to reproduce or distribute lecture notes and course materials publicly (whether or not a fee is charged) without the express written consent of a faculty member. Unauthorized sharing of class content is subject to academic discipline.

Similarly, students own copyright in their own original papers and exam essays. If a faculty member wishes to post a student's answers or papers on the course website, they should ask for the student's written permission.

6. Use of Recordings

Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation and/or the participant has the prior written permission of the instructor. Unauthorized recording and/or sharing of class content is subject to academic discipline.

7. Policy on Attendance

Any student who, in the opinion of the instructor, is absent too frequently from class or laboratory periods in any course, will be reported to the Dean of the Faculty offering the course, after due warning has been given. On the recommendation of the department concerned, and with the permission of the Dean of that Faculty, the student will be debarred from taking the regular examination in the course.