

Mathematics 424, Term I, 2026-27

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- **Textbook:**

Differential Geometry of Curves and Surfaces, Revised and Updated ed. M.P. do Carmo

- **Time and Location:**

MWF 9am-10am, MATH Building, Room 203

- **Prerequisites:**

Either (a) a score of 68% or higher in MATH 223 or (b) a score of 80% or higher in one of MATH 152, MATH 221; and either (a) a score of 68% or higher in MATH 227 or (b) a score of 80% or higher in one of MATH 217, MATH 254, MATH 264, MATH 317.

- **Topics:**

The course is on differential geometry of curves and surfaces in $\mathbb{R}^3$, with emphasis on surface theory. We will introduce foundational concepts, such as curvature of curves, the tangent plane and differential of maps, differential forms, the first and the second fundamental forms of surfaces, Gauss curvature and the mean curvature of surfaces, Gauss map and vector fields, geodesics and parallel transport. We will study Gauss' Theorema Egregium, and the Gauss–Bonnet Theorem which beautifully demonstrates the connection of local properties vs the global topology of the surface. If we have time, we will discuss Minkowski formulas and the Alexandrov theorem.

- **GRADE:** 10% homework + 40% midterm exams + 50% final exam

- Homework: Six sets on **Canvas**, due in 7 days, with the lowest score dropped.
- Midterm Exams: Two 50 minutes in class, closed-book exams on October 5 (Monday) and November 6 (Friday).
- Final exam: 120 minutes, closed-book, exact date unknown yet.

- **POLICY:**

- No make-up midterm exam will be given. For a missed midterm exam with doctor's note, the weight will be shifted to the final exam.
- No extension of homework due date.
- Copying homework solutions from other students, from the web or from any other source, and turning them in as your own is a violation of the Academic Code of UBC.

- **STUDY AID:**

- AI: use the rapidly evolving technology to explore the topics covered in class and beyond.
- Office hours: directly talk to TA and instructor.
- Piazza at Canvas: discuss with classmates with inputs from TA and instructor.