

MTH 406 - DIFFERENTIAL GEOMETRY OF CURVES AND SURFACES

SEMESTER 2, 2018-19

General Information

Instructor: Dr. Kashyap Rajeevsarathy
Office: AB1-314
Office hours: Monday, 12:00 PM - 1:00 PM
Email: kashyap@iiserb.ac.in
Schedule:

Day	Timing	Classroom
Tuesday	2:00 PM - 3:00 PM	AB1-316
Wednesday	2:00 PM - 3:00 PM	AB1-316
Friday	2:00 PM - 3:00 PM	AB1-316 (or CREATES CSC)

Webpage: [MTH 406 webpage](#)

Course structure

You are advised to check the [Lesson plan](#) for weekly updates.

Topics

- *Curves*: curves in space, tangent vector, arc length, curvature, torsion, Frenet formulas
- *Surfaces*: parametrization, tangent plane, orientability, first fundamental form, area, orientation, Gauss map, second fundamental form, Gauss curvature, ruled and minimal surfaces

- Geodesics, isometries of surfaces, Gauss' Theorema Egregium, Codazzi-Mainardi equations
- Gauss-Bonnet theorem for compact surfaces

Suggested references

1. Pressley, *Elementary Differential Geometry*, Springer, Indian reprint, 2004.
2. Manfredo do Carmo, *Differential Geometry of Curves and Surfaces*, Prentice Hall, 1976.
3. D. J. Struik, *Lectures on Differential Geometry*, Dover, 1988.
4. Barrett O'Neill, *Elementary Differential Geometry (2nd Ed.*, Academic Press (Elsevier), 2006.

Course policies

Homework policy

- Homework assignments will be due every other week. The problems to be turned in and the due dates will be posted on the course webpage. So it is your responsibility to regularly check the course webpage for any updates.
- If you must miss the class on a due date, try turning in your assignment in advance or have some one else turn it in for you.
- Problems written should be legible and must clearly indicate the steps used to arrive at the solution.
- While you are encouraged to share and discuss ideas with your classmates, I would strongly caution you against copying solutions verbatim from someone else's work.

Quiz and exam policy

- Up to two quizzes may be administered during the course of the semester - one before the midterm and another before the final. The syllabus for the quizzes will be announced in class.

- The schedule for the midterm and final exams will be as per the academic calendar.
- The topics for the midterm exam will be announced in class in due course. However, the final exam will be comprehensive with more emphasis on topics that will be discussed after the midterm exam.
- No books, notes, or electronic devices of any kind may be used during exams.
- When graded exams or quizzes are returned, please check them carefully for any grading errors. All grading issues should be brought to my attention as soon as possible. Note that your scores are not negotiable after the final grades are submitted.
- Do not make travel plans that might prevent you from taking any scheduled exam or quiz. If you have a verifiable reason why you cannot be present at an exam, you must contact me in advance to make an alternative arrangement.
- Strong disciplinary action will be initiated against students indulging in academic malpractices (or misconduct) during quizzes/exams which include any form of cheating, impersonation, copying, carrying unauthorized material etc., as per the prevailing academic norms of the Institute available at:
[Circular - Disciplinary actions for various acts of academic malpractices.](#)

Grading Scheme

A total of 100 percentage points will be distributed as follows:

- Homework & Quizzes - 20 %
- Midterm - 30 %
- Final Exam - 50 %