LINKÖPINGS UNIVERSITET
Matematiska Institutionen
Milagros Izquierdo

Notice: The programme shows when will go through each topic roughing speaking. The program follows the main book of the course:

Andrew Pressley **Elementary Differential Geometry**.

The book contains a list of very good Exercises. I advice you to solve them. Remember: to learn maths is to do maths!

You find extra material, including some lists of proposed training exercises, in the LISAM virtual classroom of the course.

Programme for TATA74 : Differential Geometry. Fall 2023

Sections

Curves. Seminars 1-5:
Seminar 1. Curves: Parametrization and Tangent and Normal Vectors
Exercises: 1.2.i, 1.3.i, 1.6, 1.7, 1.11, 1.12, 1.13, 1.14, 1.15, 1.16, 2.1.i, 2.1.iii

Seminar 2. Curvature of Curves. Frenet-Serret Equations and Fundamental Theorem
Exercises: 2.1.iv, 2.2 (cubic curve), 2.3, 2.4, 2.14, 2.19, 2.21

Seminar 3. Bézier Curves (Extra material. See course web-page and LISAM).

Seminar 4. Special Curves

Seminar 5. Global Properties of Curves
Exercises: 3.2, 3.3, 3.4, Extra exercises will be provided at the seminar

Surfaces and their Curvatures. Seminars 6-10:
Seminar 6. Surfaces and Charts, Tangent Plane and Orientation.

Seminar 7. I-fundamental Form. Lengths, Areas. Isometric and Conformal Surfaces

Seminar 8. II-fundamental form and normal curvatures

Seminar 9. Gaussian Curvature

Monday, October 9 (13:00) Hand-in Examination, Exercises Part I.

Seminar 10. Bézier Surfaces

Seminars 11-18:
Seminar 11. Presentation of Examination Part I

Seminar 12. Lecture 11. Geodesics and Parallell Translation.

Seminar 13. Lecture 12. Minimal and Ruled Surfaces

Seminar 14. Lecture 13. Geodesic Coordinates and Gauss' Theorem Egregium

Monday, November 13 (15:15) Hand-in Examination, Exercises Part II.

Seminar 15. Lecture 14. Gauss-Bonnet Theorem

Seminar 16. Lecture 15. Introduction to Riemannian Manifolds

Seminar 17. Presentation of Examination Part II (Tuesday, November 21, 15:15-17:00)

Friday November 24 (15:00) Hand-in Examination, Exercises Part III.

Seminar 18. Presentation of Examination Part III