MATH 346 – DIFFERENTIAL GEOMETRY II

Semester: Spring 2011
Instructor: Alex Degtyarev
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Exams & Grading: 2 Midterms
- **1$^{\text{st}}$ Midterm** (%25) $\sim 5^{\text{th}}$ week
- **2$^{\text{nd}}$ Midterm** (%25) $\sim 10^{\text{th}}$ week

Final exam (%40)
- **Final Exam**   Finals week

Homeworks (%10)
75% attendance is obligatory

Course Schedule: Monday   9:40–10:30 am   Room SAZ 04
                     Wednesday 10:40–12:30 pm   Room SAZ 04
Office Hours: Wednesday   9:40–10:30 am
                     Thursday   10:40–11:30 pm

Textbook: Manfredo P. do Carmo, *Differential Geometry of Curves and Surfaces*, (Prentice-Hall, New Jersey, 1976)
Supplementary: Luther Pfahler Eisenhart, *A Treatise on the Differential Geometry of Curves and Surfaces*, (Dover publications, New York, 1960)

Tentative course contents

- Intrinsic geometry of surfaces (continued):
  - review of Math 345;
  - the Gauss-Bonnet theorem;
  - the exponential map;
  - shortest geodesics.
- Global differential geometry of surfaces:
  - rigidity of the sphere;
  - completeness *vs.* geodesic completeness;
  - the Bonnet theorem (compactness of surfaces of positive curvature);
  - Jacobi fields and conjugate points; Jacobi's theorem;
  - Hadamard theorem (on surfaces of negative curvature);
  - surfaces of zero Gaussian curvature;
  - abstract surfaces;
  - Hilbert's theorem on the hyperbolic plane;
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