Math-484 List of definitions and theorems

Material from previous exams may appear on this exam, but the focus will be on the material below.

Definitions (Midterm 4):
- duality gap *page 209*
- function $g^+(x)$ *page 215*
- absolute value penalty function *page 217*
- penalty parameter *page 217*
- Courant-Beltrami penalty function *page 219*
- generalized penalty function *page 223*
- generalized penalty objective function *page 223*
- Definition of $L^\epsilon(x, \lambda), P^\epsilon, MP^\epsilon, DP^\epsilon, MD^\epsilon$ *page 230*
- Definition of surface, normal space $N(\mathbf{x}^0)$ and tangent space $T(\mathbf{x}^0)$ to S at $\mathbf{x}^0$ (Theorem 7.1.1) *page 241*
- Definition of path in a surface S (Theorem 7.1.3) *page 243*
- Definition of a regular point (Theorem 7.1.3) *page 246*
- Definition of Lagrange multipliers and the Lagrange multiplier conditions *page 248*

Theorems and statements (Midterm 4):
- Description of first partial derivatives of $[g^+(x)]^2$ (Theorem 6.1.3) *page 219*
- Describe the penalty function method (6.2.1) *page 220*
- Description of the sequence of global minimizers of $P_k(x)$ and its convergent subsequence (Theorem 6.2.3) *page 221-222*
- No duality gap for a consistent convex program with a coercive objective function. (Theorem 6.3.1) *page 227*
- How to modify any convex function to a coercive one? (why it is coercive?) (with proof) *page 229*
- The relations between $P^\epsilon, MP^\epsilon, DP^\epsilon, MD^\epsilon$? (Theorem 6.3.2) *page 230*
- Relationship between $MP = \inf_{\varepsilon>0}\{MD^\varepsilon\}$? (with proof) (Theorem 6.3.4) *page 232*
- What can you say when (P) is superconsistent and $MP > -\infty$? (Theorem 6.3.5) *page 232-233*
- What is the relationship between vectors in $T(\mathbf{x}^*)$ and paths in S. *Theorem 7.1.5 page 244*
- What can you say about a local minimizer of a program that is also a regular point. *Theorem 7.2.1 page 244*