**Math 162A Suggested Syllabus**

**Text:** *Elementary Differential Geometry,* by Barrett O’Neill, revised 2nd edition

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| **Lecture** | **Section** | **Topic(s)** |
| 1 | 1.1 & 1.2 | Euclidean Space and Tangent Vectors |
| 2 | 1.2 & 1.3 | Directional Derivatives  |
| 3 | 1.4 | Curves in $R^{3}$ |
| 4 | 1.5 | 1-Forms |
| 5 | 1.6 | Differential Forms |
| 6 | 1.6 & 1.7 | Differential Forms and Mappings |
| 7 | 1.7 | Mappings (cont) |
| 8 | 2.1 | Dot Product |
| 9 | 2.2 | Curves |
| 10 | 2.3 | The Frenet Formulas |
| 11 | 2.3 | The Frenet Formulas (cont) |
| 12 | 2.3 | The Frenet Formulas (cont) |
| 13 |  2.4 | Arbitrary-Speed Curves |
| 14 | **Review** |  |
| 15 | **Midterm** |  |
| 16 | 2.5 | Covariant Derivatives |
| 17 | 2.6 | Frame Fields |
| 18 | 2.7 & 2.8 | Connection Forms and the Structural Equations |
| 19 | 4.1 | Surfaces in $R^{3}$ |
| 20 | 4.2 | Patch Computations |
| 21 | 4.2 | Patch Computations (cont) |
| 22 | 4.3 | Differential Functions and Tangent Vectors |
| 23 | 4.3 | Differential Functions and Tangent Vectors (cont) |
| 24 | 4.4 | Differential Forms on a Surface |
| 25 | 4.4 | Differential Forms on a Surface (cont) |
| 26 | 4.5 | Mappings of Surfaces |
| 27 | 4.5 | Mappings of Surfaces (cont) |
| 28 | **Review**  |  |
| 29 | **Review** |  |