MTH 490 – Annotated Bibliography & Outline Guide

What is an annotated bibliography?

An annotated bibliography is a list of citations to books, articles, and documents. Each citation is followed by a brief (usually ≤ 150 words) descriptive and evaluative paragraph, the annotation. The purpose of the annotation is to inform the reader of the relevance, accuracy, and quality of the sources cited. Annotations may describe topics covered, theorems, proofs, examples, etc.

Creating an annotated bibliography

- First, locate and record citations to books, periodicals, and documents that may contain useful information and ideas on your topic. Briefly examine and review the actual items. Then choose those works that provide a variety of perspectives on your topic.
- Cite the book, article, or document using the appropriate style.
- Write a concise annotation that summarizes the central theme and scope of the book or article. Include one or more sentences that describe the usefulness of the document and the role it plays in your project.

Examples

1. Olver, Peter. *Applications of Lie Groups to Differential Equations.* Springer. New York (2000).

   Provides much of the theory on symmetries of differential equations with the Proof of Theorems A, B, and C. Several valuable examples of reduction methods found on p. 252.

2. Spivak, Michael. *A Comprehensive Introduction to Differential Geometry.* Vol 1. Publish or Perish Inc. Houston, Texas (2005).

   Excellent introduction to the theory of manifolds. Spivak provides several illustrations along with a clear exposition. His proof of Theorem 17 on p. 53 shows that every compact manifold can be imbedded in $\mathbf{R}^n$ for some n.

3. ...

The Project Outline

Give the proposed structure of your capstone paper in terms of chapters, sections, and subsections (if relevant). Include a proposed title.

Example Outline

Title: Symmetry Analysis of Differential Equations

1. Introduction
   (a) A short history of symmetry techniques
   (b) Main goals/theorems
   (c) Structure of capstone paper
2. Preliminary Theory
   (a) Symmetry Transformations
   (b) Infinitesimal symmetries
   (c) Lie's invariance condition
   (d) ...
3. Symmetry analysis of equations of the form $F(x, y, u, u_x, u_y) = 0$
   (a) Background/Motivation
   (b) Special Forms
      i. Form 1
      ii. Form 2
4. ...
5. Conclusion
   (a) Summary
   (b) Future Work
6. Appendices
   (a) Appendix A: The multivariate chain rule
   (b) Appendix B: Long formulas