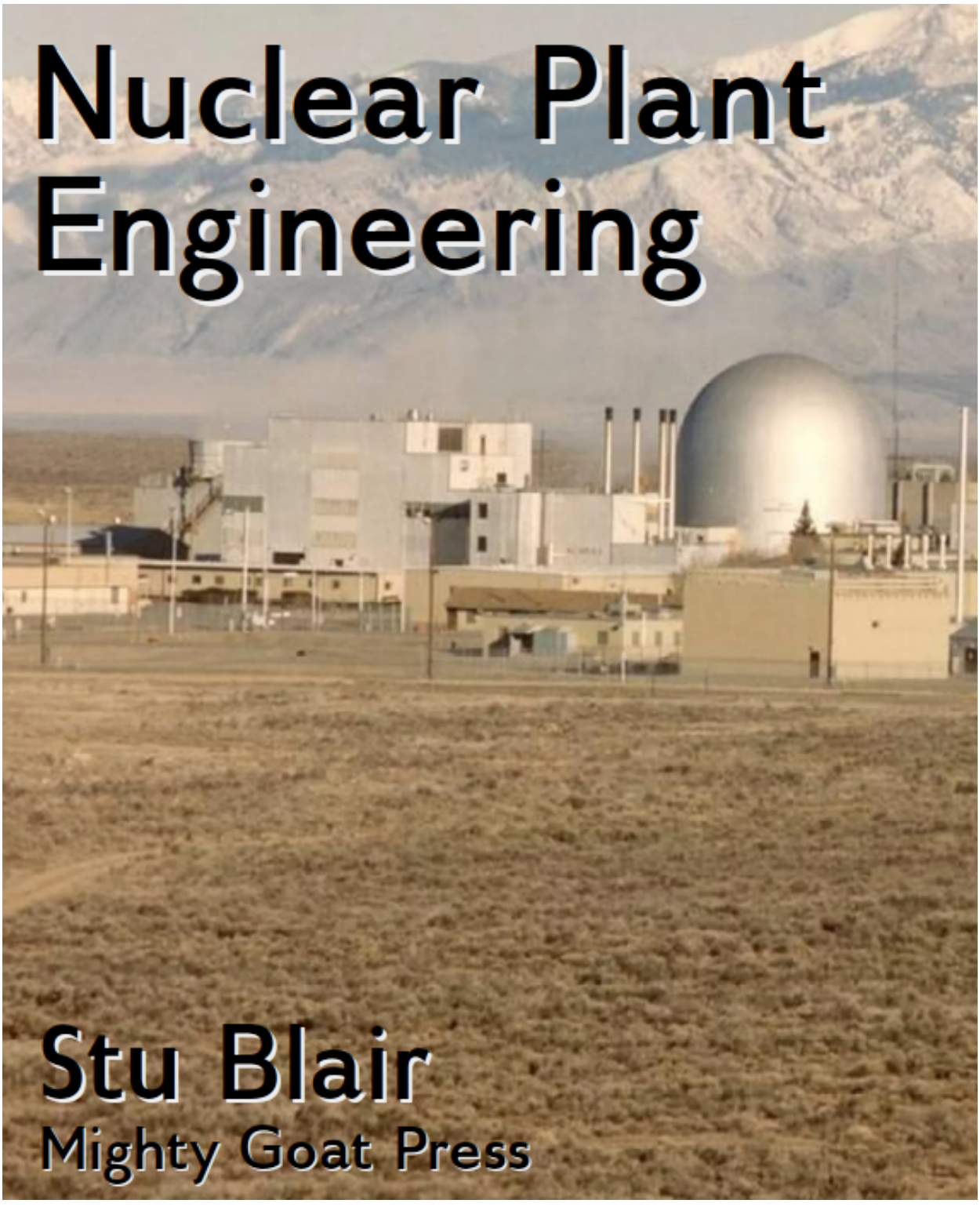
Nuclear Plant Engineering



Stu Blair

Mighty Goat Press

...PRINCIPLES ARE MORE IMPORTANT THAN FACTS...

H.G. RICKOVER

. . . ONE OF THE PREREQUISITES OF ORIGINALITY IS THE ART OF FORGETTING, AT THE PROPER MOMENT, WHAT WE KNOW. WITHOUT THIS ART THE MIND REMAINS CLUTTERED WITH READY-MADE ANSWERS AND IS NOT FORCED TO ASK THE PROPER QUESTIONS.

H.G. RICKOVER

UNITED STATES NAVAL ACADEMY

MATHEMATICAL METHODS FOR ENGINEERS

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Preface

Preface goes here....

Part I

Introduction and Review

Lecture 1 - Introduction, Definitions and Terminology

Objectives

The objectives of this lecture are:

- Provide an overview of course content
- Define basic terms related to differential equations
- Provide examples of classification schemes for differential equations

Course Introduction

The basic topics that we will cover include:

Part II

Power Series Methods

Part III

Back Matter

Bibliography

Appendices

Matlab Style Rules

1. **rule:** All scripts will start with the commands: **clear**, **clc**, and **close 'all'**

   rationale: No script should depend upon any data visible in the MATLAB workspace when the script starts. By omitting these commands, residual data within the workspace may hide errors.

2. **rule:** Your code must be documented with enough details such that a reader unfamiliar with your work will know what you are doing.

   rationale: Code documentation is a habit. For more significant projects readers may need help in deciding what the author of the code intended. For your own code, the most likely reader is you—a few months into the future.

3. **rule:** Function and variable names must be meaningful and reasonable in length.

   rationale: Failing to do either make code harder to read and maintain.

4. **rule:** All outputs from the code **must** be meaningful; numbers should be formatted, part of a sentence, and include units. Graphs should be readable and axis labels should make sense and include units.

   rationale: Code output is a form of communication. It is important that this communication be clear and unambiguous.

5. **rule:** Do not leave warnings from the Code Analyzer unaddressed.

   rationale: Sometimes Code Analyzer warnings can be safely ignored. Most of the time the warning points to a stylistic error that would be unacceptable in software that you use. Occasionally these warnings are indicative of a hidden error.

6. **rule:** Use the "smart indentation tool" to format the indentation of your code.

rationale: This tool improves code readability. It will also occasionally point out errors that you did not see before.

7. **rule:** Pre-allocate arrays; if possible initialize with **NaN** values.

   rationale: Pre-allocation improves performance and helps readability. Initialization with **NaN** helps avoid a range of potential logical errors.

8. **rule:** Avoid "magic numbers" — i.e. hard-coded constants.

   rationale: Constants included in your code tend to hide your program logic. Also, "magic numbers" make code maintenance more difficult and error prone.

9. **rule:** Only write one statement per line.

   rationale: Multi-statement-lines hurt code readability in almost all cases.

10. **rule:** Do not write excessively long lines of code; use the line continuation "..." and indentation to spread long expressions over several lines.

    rationale: Following this rule improves code readability.