In contemplating the third edition, I have had multiple objectives to achieve. The first and foremost important objective is to maintain the accessibility and readability of the book to a broad readership with varying mathematical backgrounds and sophistication. More proofs, more graphs, more explanations, and more applications are provided in this edition.

The second objective is to update the contents of the book so that the reader stays abreast of new developments in this vital area of mathematics. Recent results on local and global stability of one-dimensional maps are included in Chapters 1, 4, and Appendices A and C. An extension of the Hartman–Grobman Theorem to noninvertible maps is stated in Appendix D. A whole new section on various notions of the asymptoticity of solutions and a recent extension of Perron’s Second Theorem are added to Chapter 8. In Appendix E a detailed proof of the Levin–May Theorem is presented. In Chapters 4 and 5, the reader will find the latest results on the larval–pupal–adult flour beetle model.

The third and final objective is to better serve the broad readership of this book by including most, but certainly not all, of the research areas in difference equations. As more work is being published in the Journal of Difference Equations and Applications and elsewhere, it became apparent that a whole chapter needed to be dedicated to this enterprise. With the prodding and encouragement of Gerry Ladas, the new Chapter 5 was born. Major revisions of this chapter were made by Fozi Dannan, who diligently and painstakingly rewrote part of the material and caught several errors and typos. His impact on this edition, particularly in Chapters 1, 4, and Chapter 8 is immeasurable and I am greatly indebted to him. My thanks
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I hope you enjoy this edition and if you have any comments or questions, please do not hesitate to contact me at selaydi@trinity.edu.

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Suggestions for instructors using this book.

The book may be used for two one-semester courses. A first course may include one of the following options but should include the bulk of the first four chapters:

1. If one is mainly interested in stability theory, then the choice would be Chapters 1–5.

2. One may choose Chapters 1–4, and Chapter 8 if the interest is to get to asymptotic theory.

3. Those interested in oscillation theory may choose Chapters 1, 2, 3, 5, and 7.

4. A course emphasizing control theory may include Chapters 1–3, 6, and 10.
The diagram above depicts the dependency among the chapters.
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Elaydi, S.
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