

Hale, Jack K.; Verduyn Lunel, Sjoerd M.

Introduction to functional differential equations. (English) Zbl 0787.34002
Applied Mathematical Sciences. 99. New York, NY: Springer-Verlag. ix, 447 p. (1993).

This book is built upon an earlier work of the first author entitled “Theory of Functional Differential Equations” (1977; [Zbl 0352.34001](#)) and it presents a more complete presentation of the theory of functional differential equations. It contains the material of that book, but completely revised and updated with the most recent and significant results on functional differential equations. Chapters 1,2,3,4,5 are presented as in the previous book with the following exceptions: 1) §§2.7, 2.8 and 3.7: they contain some things from NFDE, 2) §3.3: it contains some results on small solutions, 3) §4.3: it contains a few new results for the case where the solution map is asymptotically smooth. A complete new presentation of linear systems for RFDE and NFDE is given in chapters 6 and 9, while in chapter 8 the decomposition of the space C is presented in detail (§8.2). An example for integer delays is presented in §8.3. Chapter 10 is the same, but it also contains a study of nonhyperbolic equilibrium points (§10.2). Chapters 7 and 11 are unchanged, while chapter 12 is completely new (except §12.4 about genericity) incorporating a guide to active topics of research as e.g. singular FDE, averaging, infinite delay. In the sections on supplementary remarks they have included many references to recent literature as well as many new remarks (§§6.6, 7.11, 11.7, 12.10).

Reviewer: [G.Karakostas \(Ioannina\)](#)

MSC:

- [34-02](#) Research exposition (monographs, survey articles) pertaining to ordinary differential equations
- [34K05](#) General theory of functional-differential equations
- [34K99](#) Functional-differential equations (including equations with delayed, advanced or state-dependent argument)
- [34K20](#) Stability theory of functional-differential equations
- [34K40](#) Neutral functional-differential equations

Cited in **14** Reviews
Cited in **2627** Documents

Keywords:

[functional differential equations](#); [integer delays](#); [averaging](#); [infinite delay](#)