# Table of Contents

Copyright Permissions ........................................................................................................................................ iii

Background .................................................................................................................................................. v

Course Goals and Objectives ................................................................................................................. vii

Unit 1: Course Introduction .................................................................................................................. 1-1

Unit 2: Executive Order 12699 ............................................................................................................. 2-1

Unit 3: Earthquake Causes and Characteristics ................................................................................... 3-1

Unit 4: Earthquake Effects ..................................................................................................................... 4-1

Unit 5: Protecting Your Community .................................................................................................... 5-1

Unit 6: Evaluating Your Community’s Safety ....................................................................................... 6-1

Unit 7: Conclusions .............................................................................................................................. 7-1

Appendix A: Major Earthquakes in the United States, Mexico, and Canada, 1700-2004 ........ A-1

Appendix B: Executive Order 12699 .................................................................................................. B-1

Glossary .................................................................................................................................................. G-1

Final Examination ..................................................................................................................................... E-1

References .............................................................................................................................................. R-1
Copyright Permissions

Inclusion of the copyrighted material listed below does not place it in the public domain. Reproduction of copyrighted material is permitted only as part of reprinting this Independent Study course. FEMA (NEHRP) allows the reprinting of this course manual in full by any party that credits FEMA and that will distribute it while making no profit at no cost. Any other reproduction of copyrighted material is prohibited without the expressed written consent of the copyright holder.

Figure 3-3 is reprinted from *Earthquakes, Volcanoes, and Tsunamis*, by K. Steinbrugge (1982), with permission of the publisher, Skandia America Group.

Figures 3-9 and 3-10 are reprinted from *Earthquakes*, by Bruce A. Bolt (1993), with permission of the author.

Figure 3-11 is reprinted from “The Mississippi Valley Earthquakes of 1811 and 1812: intensities, ground motion, and magnitudes,” by Otto W. Nuttli, *Bulletin of the Seismological Society of America* 63:1, pages 227-248, with permission of the publisher.

Figures 3-13, 4-10, 4-11, and 4-12 are reprinted from *The Seismic Design Handbook*, ed. Farzad Naeim (1989), with permission of the publisher, Chapman and Hall.

Figures 4-7, 4-14, 4-20, and 4-22 are reprinted from *Earthquakes: An Architect’s Guide to Nonstructural Seismic Hazards*, by Henry J. Lagorio. Copyright © 1990 by John Wiley & Sons, Inc. Reprinted by permission of John Wiley & Sons, Inc.
Background

Since the Earthquake Hazards Reduction Act was passed in 1977, many actions have been taken to improve seismic safety. Executive Order 12699, “Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction,” signed by President Bush in January 1990 is a significant Federal seismic risk reduction action. This Executive Order requires all new Federal, federally assisted, and federally regulated buildings to be appropriately seismic resistant. Among new construction affected are all buildings financed, either partially or fully, with Federal grants or federally guaranteed loans.

Because this Executive Order is so wide reaching, covering everything from single-family dwellings to large Federal complexes across the nation, a training course was needed to provide the tools, information, and planning guidance for those people affected by the Executive Order. The purpose of this course is to provide individuals in State and local governments, and the building and financial industries, with information about the requirements of the Executive Order and how they will be implemented. The course is also intended to provide the student with basic knowledge about earthquakes and how buildings can be built to be safe during an earthquake.
Course Goals and Objectives

The goal of this training course is to provide the students with the tools, information, and planning guidance they need to effectively deal with and prepare for the implementation of the Executive Order and its consequences.

At the conclusion of this course, the student will be able to:

- Describe the intent and implications of the Executive Order and the consequences of noncompliance;

- Describe how the Executive Order will affect the built environment;

- Describe the theory and practice of the Executive Order, hazard mitigation, and the need/rationale for including seismic provisions in the building codes;

- Compare Executive Order standards and local codes to determine substantive differences and deficiencies; and

- Develop a plan of action to achieve compliance if local codes do not comply with the Executive Order.