

**Box List:** Roy A. Axford Papers, 1951-2013  
 Nuclear Engineering Department, UIUC  
**ID:** 11/12/21

**Arrangement:**

**Series 1: Student Work, 1951-1959**  
**Series 2: Course Materials, 1989-2013**  
**Series 3: Research and Professional Engagement, 1951-2006**

**Complete Finding Aid:**

<http://archives.library.illinois.edu/archon/index.php?p=collections/controlcard&id=XXX>  
 Box list created 2024

**Repository:**

**University Archives**  
**University of Illinois at Urbana-Champaign**  
<http://archives.library.illinois.edu/>

**Series 1: Student Work, 1951-1959**

This series contains coursework from Axford's as a teaching assistant as a graduate at MIT. This includes written lectures, syllabi, and course schedules. This series is arranged by course number, with material with no course number and Ph.D. thesis work listed last.

**Box 1**

**100s**

1. Physics 161 – Principles of Electronic, Spring 1953

**200s**

2. Applied Mathematics 201 – Functions of a Complex Variable, Fall 1952
3. 206 Nel, lectures in reactor theory vol. 1, ca. 1950s
4. Lectures in reactor theory vol. 2, ca. 1950s

**M-xx**

5. M-39 – Methods of Applied Mathematics, Fall 1955
6. M-631 – Integral Equations, Spring 1954

**2.xxx**

7. 2.451 – Advanced Heat Transfer, Fall 1953
8. 2.451 & 2.452 – Advanced Engineering Thermodynamics, 1955-1956
9. 2.42 – Heat Engineering, Summer 1953

**Box 2**

1. 2.522 – Advanced Heat Transfer, Spring 1956
2. 2.522 – Advanced Heat Transfer, Lectures on Transient Heat Conduction and Thermal Studies, ca. 1960s

**5.xxx**

3. 5.71 – Chemical Thermodynamics I, Fall 1951

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**Box 2**

6.xxx

4. 6.581 – Transients in Linear Systems, Part I, Fall 1955

8.xxx

5. 8.01-8.06 – Introduction to Mechanics, Thermodynamics, Electromagnetic Theory, and Atomic Physics, Spring 1957
6. 8.23 – Magnetohydrodynamics, Summer 1959
7. 8.361 – Quantum Theory of Matter I, Fall 1959
8. 8.511-8.512 – Nuclear Physics: Part I, 1953-1954
9. 8.511-8.512 – Nuclear Physics: Part II, 1953-1954

**Box 3**

1. 8.731 – Quantum Mechanics, Fall 1953
2. 8.731/10.28 – Chemical Engineering, Spring 1956
3. 8.791 – Methods of Theoretical Physics, Fall 1954

D-11

4. D-11, 1953

N-20

5. N-20 – Biological Effects of Nuclear Radiations, Fall 1953

N-21

6. N-21 – Nuclear Reactor Theory I, Fall 1953
7. N-21-T Solution Book, Fall 1954
8. N-21 Solution Book, Fall 1955

N-22

9. N-22 – Nuclear Reactor Theory II, Spring 1954

**Box 4**

1. N-22 Spring 1956
2. N-22 – Advanced Reactor Theory, Spring Term 1956 MIT
3. N-22 Monte Carlo SN Method, Spring 1956
4. N-22 Perturbation Theory, Spring 1956
5. N-22 – Advanced Reactor Theory, Problems, Spring 1956
6. N-22 – Nuclear Reactor Theory, Reactor Kinetics, Spring 1956
7. N-22-8, Transport Theory, Spring 1956
8. N-22 – Nuclear Reactor Theory II (1 of 3), Spring 1957
9. N-22 – Nuclear Reactor Theory II (2 of 3), Spring 1957
10. N-22 – Nuclear Reactor Theory II (3 of 3), Spring 1957

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**Box 4**

**N-23**

11. N-23 – Nuclear Reactor Engineering Spring Term, 1956

**Box 5**

1. N-23 – Nuclear Reactor Engineering, Spring 1957

**N-31**

2. N-31 – Nuclear Chemical Technology, Fall 1954

**No Course Number**

3. Roy Arthur Axford Project Separation
4. Unlabeled binder (1 of 5), ca. 1950s
5. Unlabeled binder (2 of 5), ca. 1950s
6. Unlabeled binder (3 of 5), ca. 1950s
7. Unlabeled binder (4 of 5), ca. 1950s
8. Unlabeled binder (5 of 5), ca. 1950s
9. Unlabeled notes, ca. 1950s

**Ph.D.**

10. *Multiple Scattering Theory of Particle Penetration through and Reflection from Finite States* (1 of 2), 1957
11. *Multiple Scattering Theory of Particle Penetration through and Reflection from Finite States* (2 of 2), 1957

**Series 2: Course Materials, 1989-2013**

This series contains written and recorded lectures of Axford's courses as a professor—mostly on nuclear engineering. This series is arranged by course and lecture number.

**Written Lectures**

12. Nuc. E. 346/346 Dr. Roy A. Axford, 2000
13. Nuc. E. 421 Dr. Roy A. Axford, Spring 2000 (1 of 2)
14. Nuc. E. 421 Dr. Roy A. Axford, Spring 2000 (2 of 2)

**Box 6**

1. NPRE 446 – Principles of Radiation Interactions with Matter, Dr. Roy A. Axford, Fall 2010/2011 (1 of 3)
2. NPRE 446 – Principles of Radiation Interactions with Matter, Dr. Roy A. Axford, Fall 2010/2011 (2 of 3)
3. NPRE 446 – Principles of Radiation Interactions with Matter, Dr. Roy A. Axford, Fall 2010/2011 (3 of 3)
4. NPRE 447 Dr. Roy A. Axford, 2005-2013 (1 of 4)

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**Box 6**

5. NPRE 447 Dr. Roy A. Axford, 2005-2013 (2 of 4)
6. NPRE 447 Dr. Roy A. Axford, 2005-2013 (3 of 4)
7. NPRE 447 Dr. Roy A. Axford, 2005-2013 (4 of 4)
8. NPRE 521 Dr. Roy A. Axford, 2005-2013 (1 of 3)
9. NPRE 521 Dr. Roy A. Axford, 2005-2013 (2 of 3)
10. NPRE 521 Dr. Roy A. Axford, 2005-2013 (3 of 3)
11. Nuc. E. 555 Dr. Roy A. Axford, 2001-2013 (1 of 4)
12. Nuc. E. 555 Dr. Roy A. Axford, 2001-2013 (2 of 4)
13. Nuc. E. 555 Dr. Roy A. Axford, 2001-2013 (3 of 4)
14. Nuc. E. 555 Dr. Roy A. Axford, 2001-2013 (4 of 4)
15. Nuc. E. 556 Dr. Roy A. Axford, 1994-2012 (1 of 4)
16. Nuc. E. 556 Dr. Roy A. Axford, 1994-2012 (2 of 4)
17. Nuc. E. 556 Dr. Roy A. Axford, 1994-2012 (3 of 4)
18. Nuc. E. 556 Dr. Roy A. Axford, 1994-2012 (4 of 4)
19. NPRE 598 Plasma Physics, Fall Term 2006
20. Dr. Roy A. Axford misc. notes, 1991-2000 (1 of 5)

**Box 7**

1. Dr. Roy A. Axford misc. notes, 1991-2000 (2 of 5)
2. Dr. Roy A. Axford misc. notes, 1991-2000 (3 of 5)
3. Dr. Roy A. Axford misc. notes, 1991-2000 (4 of 5)
4. Dr. Roy A. Axford misc. notes, 1991-2000 (5 of 5)
5. Classical Electrodynamics, undated
6. Classical Mechanics, undated
7. Differential-Differences Discretization, undated
8. Transformation to Cylindrical MEL Coordinates, undated
9. Transformations to Spherical MEL Coordinates, undated

**Recorded Lectures**

**Box 8**

1. NE 346, Axford, Lectures 1-22, Spring 1989

**Box 9**

1. NE 345, Axford, Lectures 23-27, Spring 1989

**Box 10**

1. NE 411 – Nuclear Reactor Heat Transfer, Axford, Lectures 1-22, Spring 1990

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**Box 11**

1. NE 411 – Nuclear Reactor Heat Transfer, Axford Lectures 23-43, Spring 1990

**Series 3: Research and Professional Engagement, 1951-2006**

This series contains research notes, publications, memos, activity reports, project summaries, and conferences. The majority of this material comes from Axford's work with Los Alamos. This series is arranged alphabetically.

**Box 12**

1. 1992 Nuclear Explosive Code Developers Conference, Sunnyvale, California, Nov. 2-6, 1992
2. 4455 MSSB 505-667-1174 Vol. 1, 1970s-1990s (1 of 3)
3. 4455 MSSB 505-667-1174 Vol. 1, 1970s-1990s (2 of 3)
4. 4455 MSSB 505-667-1174 Vol. 1, 1970s-1990s (3 of 3)
5. 4455 MSSB 505-667-1174 Vol. 2, 1970s-1990s (1 of 3)
6. 4455 MSSB 505-667-1174 Vol. 2, 1970s-1990s (2 of 3)
7. 4455 MSSB 505-667-1174 Vol. 2, 1970s-1990s (3 of 3)
8. Analysis of Nuclear Energy Systems Statement of Work, Subcontract 9-XG9-22682-1, undated
9. Constrained Optimal Programming Problems in Reactor Statistics, undated
10. Commonwealth Edison Seminar, Dec. 2, 1993 transparencies
11. Cylindrical coordinates notes transparencies, undated
12. Cylindrical coordinates notes and transparencies, undated
13. "Differential Equations Invariant Under Two-Parameter Lie Groups with Applications to Nonlinear Diffusion" by Roy Arthur Axford, Los Alamos Scientific Laboratory binder, August 1970
14. Direct evaluation of transient surface temperatures, undated
15. "Effects of Cladding Thickness and Thermal Conductivity on Heat Transfer..." by O.E. Dwyer & H.C. Berry US Atomic Energy Commission, June 1969
16. "Exact Solution of Singular Arc Problems in Reactor Core Optimization Via Lie Groups" by Roy A. Axford, ca. 1970s
17. "Fundamental Aspects of Similarity Analysis in Hydrodynamics & Radiation Hydrodynamics," Axford, 1982
18. "Group Invariance Problems of the Poisson-Boltzmann and other Nonlinear Field Equations," undated
19. Integral Invariants of Nonhomogenous Contact Transformations notes and equations, undated
20. LA-4517 figures, undated
21. Lie Groups – Axford publications and transparencies, undated
22. Lie group writings, 1986
23. List of Scandinavian Mathematicians, undated
24. Los Alamos notes, undated
25. Los Alamos publications, Axford, 1973-2005
26. Los Alamos publications, Axford, 1973-2005

**Box 13**

1. Los Alamos publications, Axford, 1973-2005
2. Los Alamos – submittal of LA-series report, undated

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**Box 13**

3. Los Alamos telephone directory, May 1972
4. Manuscript of LA report on differential forms, 2006
5. Memos, 1980s
6. "Multiregion Analysis of Temperature Fields and Heat Fluxes in Tube Bundles with Internal, Solid, Nuclear Heat Sources" binder, 1965
7. "Nearly Self-Similar, Finite-Strength, Blast Waves in Geological Materials," Axford, Eilers, Hill, & Holm, 1988
8. NECDC – paper for NECDC Nov. 1992
9. NECDC presentation on Nov. 3, 1992 - transparencies
10. Notes and equations transparencies, undated
11. Ohio State University mechanical/nuclear engineering seminars, October 23, 1991
12. "On Initial Value Problems of the Rayleigh-Taylor Instability Type" by Roy A. Axford (1 of 3), 1973
13. "On Initial Value Problems of the Rayleigh-Taylor Instability Type" by Roy A. Axford (2 of 3), 1973
14. "On Initial Value Problems of the Rayleigh-Taylor Instability Type" by Roy A. Axford (3 of 3), 1973
15. Paper for 1973 WAM (Winter Annual Meeting) of ASME (American Society of Mechanical Engineers)
16. Raytheon Manufacturing Company, ca. 1950s
17. Research Proposals, 1970-1976
18. "Space Flight Propulsion Systems" by Roy A. Axford transparencies
19. "Summary of Theoretical Aspects of Heat Transfer Performance in Clustered Rod Geometries" by Roy A. Axford (work performed under the auspices of the United States Atomic Energy Commission) binder (1 of 2), ca. 1960s-1970s
20. "Summary of Theoretical Aspects of Heat Transfer Performance in Clustered Rod Geometries" by Roy A. Axford (work performed under the auspices of the United States Atomic Energy Commission) binder (2 of 2), ca. 1960s-1970s
21. Summer activity reports, 1999-2002
22. Research Notes (1 of 3), undated

**Box 14**

1. Research Notes (2 of 3), undated
2. Research Notes (3 of 3), undated
3. Research binder 1, undated (1 of 2)
4. Research binder 1, undated (2 of 2)
5. Research binder 2, undated (1 of 2)
6. Research binder 2, undated (2 of 2)
7. Research binder 3, undated (1 of 2)
8. Research binder 3, undated (2 of 2)
9. Research binder 4, undated (1 of 2)
10. Research binder 4, undated (2 of 2)
11. Research binder 5, undated
12. Research binder 6, undated (1 of 2)
13. Research binder 7, undated (2 of 2)
14. Research binder 7, undated (1 of 2)

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**Box 14**

15. Research binder 7, undated (2 of 2)
16. Research binder 8, undated (1 of 2)
17. Research binder 8, undated (2 of 2)
18. Research binder 9, undated

**Box 15**

1. Research binder 10, undated (1 of 2)
2. Research binder 10, undated (2 of 2)
3. Research binder 11, undated (1 of 3)
4. Research binder 11, undated (2 of 3)
5. Research binder 11, undated (3 of 3)

Processing Notes: Material from binders that were too large to fit in boxes have been moved to folders. Some personal items were returned to the donor's family. Title added by archivist indicated by brackets []. This series was processed by Lana Kay Tutterow under the supervision of Bethany Anderson.