

EEE 564 INTERDISCIPLINARY NUCLEAR POWER OPERATIONS

Course Coordinator: Dr. Keith E. Holbert

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Midterm Exam: Tuesday, October 12

Final Exam: Friday, December 10, 2010

Textbook: The primary textbook for this course is *Theory and Application of Power Plant Operations* by Robert L. Simmons, © 2009, which is posted to Blackboard as a pdf file. There are a few additional documents and references posted there for reading also.

Course Webpage: Lecture slides, homework and exams posted on Blackboard.

Course Objective: Instill the fundamental concepts and importance of nuclear safety to engineers and scientists in a variety of disciplines.

Course Outcomes: Students are

- knowledgeable about nuclear power plants and their safety systems,
- cognizant of the critical role that engineers have on the safe operation of a nuclear power plant, and
- prepared for the impacts that various engineering processes (changes and failures) have across the entire power plant.

Course Description: Nuclear power plant systems. Study of the interrelationship and propagation of effects that systems and design changes have on one another, especially in relations to nuclear power plant safety and operations. Case studies. Prerequisite: EEE 563.

Grading

“Standard” scale (with \pm) using 90-100 "A", 80-90 "B", 70-80 "C", etc.

Homework	40%
Midterm Exam	30%
Final Exam	30%

Homework: The homework assignments will be posted online. Homework is expected to be turned in on-time. Presentation and methods for arriving at the answer are just as important as the mathematical answer; solutions should be neat and logical. For complete credit: (1) show all work, and (2) box the answer and include the units. Students may work together on the homework, but copying is unacceptable: the ASU [Academic Integrity Policy](#) (AIP) is incorporated herein by reference. Please complete and submit homework assignments according to the instructions on Blackboard, as this course is nearly self-contained online.

Email: Important information may be sent to students via their ASU email account. Be sure to read your ASU email or forward it to an email account that you do read regularly.

EEE 564 SEMESTER TEACHING PLAN

(Internet, Fall 2010)

The textbook sections (given in parenthesis below) should be read **before** the class lecture.

Week	Date	Lecture Topic	Homework
1	Aug. 19-20	1. Introduction; Nuclear Safety Principles (Glossary & Chapter 1)	
2	August 23-27	2. Nuclear Power Plant Systems Overview (Sections 2.1–2.2) 3. Plant Emergency and Safety Systems – Part I (Section 2.4)	
3	Aug. 31- Sept. 3	4. Plant Emergency and Safety Systems – Part II (Sect. A.2–A.3) 5. Materials Corrosion and Chemical & Volume Control – Part I (Section 2.3)	Aug. 31: Hmwk # 1
4	Sept. 7-10	6. Materials Corrosion and Chemical & Volume Control – Part II (Section A.1) 7. Electrical Grid Disturbances – Part I (Section 2.5)	Sept. 7: Hmwk # 2
5	Sept. 13-17	8. Electrical Grid Disturbances – Part II (Section A.4) 9. Startup Preparations – Part 1 (Sections 3.1–3.4)	Sept. 14: Hmwk # 3
6	Sept. 20-24	10. Startup Preparations – Part 2 (Sections 3.5–3.8) 11. Reactor Startup – Part 1 (Sections 4.1–4.5)	Sept. 21: Hmwk # 4
7	Sept. 27 -Oct. 1	12. Reactor Startup – Part 2 (Section 4.6) 13. Reactor Startup – Part 3 (Section 4.7)	Sept. 28: Hmwk # 5
8	Oct. 4-8	14. Intro to the Nuclear Licensing Process (NUREG/BR-0298) 15. Review for Midterm Exam	Oct. 5: Hmwk # 6
9	Oct. 11-15	*** Midterm Exam *** (October 12) 16. Power Increase to the Power Range – Part 1 (Sect. 5.1–5.5)	
10	Oct. 18-22	17. Power Increase to the Power Range – Part 2 (Sect. 5.6–5.7) 18. Power Increase to the Power Range – Part 3 (Sect. 5.8–5.11)	
11	Oct. 25-29	19. Power Range Operations – Part 1 (Sections 6.1–6.3) 20. Power Range Operations – Part 2	Oct. 26: Hmwk # 7
12	Nov. 1-5	21. Power Range Operations – Part 3 (Sections 6.4–6.7) 22. Power Range Operations – Part 4 (Sections 6.8–6.10)	Nov. 2: Hmwk # 8
13	Nov. 8-12	23. Power Range Operations – Part 5 (Sections 6.10–6.12) ### Veteran's Day Holiday ###	Nov. 10: Hmwk # 9
14	Nov. 15-19	24. Power Range Operations – Part 6	
15	Nov. 22-26	25. Probabilistic Risk Assessment – Part I (Section A.5) ### Thanksgiving ###	Nov. 23: Hmwk # 10
16	Nov. 29 -Dec. 3	26. Probabilistic Risk Assessment – Part II (PRA Handout) 27. Reactor Safety Studies and Accidents (WASH-1400)	
17	Dec. 6-10	28. Review for Final Exam *** Final Exam *** (December 10)	Dec. 6: Hmwk # 11

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