

COLLEGE OF CHEMISTRY COURSE GUIDE (../INDEX.HTML)

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NUCE 167 - RISK-INFORMED DESIGN FOR ADVANCED NUCLEAR SYSTEMS (3 UNITS)

(Taken from the UC Berkeley Course Guide (<http://guide.berkeley.edu>))

COURSE OVERVIEW

SUMMARY

Project-based class for design and licensing of nuclear facilities, including advanced reactors. Elements of a project proposal. Regulatory framework and use of deterministic and probabilistic licensing criteria. Siting criteria. External and internal events. Identification and analysis of design basis and beyond design basis events. Communication with regulators and stakeholders. Ability to work in and contribute to a design team.

PREREQUISITES

Completion of at least two upper-division engineering courses providing relevant skills: ChemE 150A, ChemE 180, CE 111, CE 120, CE152, CE 166, CE 175, E 120, IEOR 166, IEOR 172, ME 106, ME 109, ME 128, ME 146, NE 120, NE 124, NE 150, NE 161

Fall only

TOPICS COVERED

- Introduce students to the methods and models for event identification, accident analysis, and risk assessment and management for internally and externally

initiated events.

- Introduce students to the regulatory requirements for design, construction and operation of nuclear facilities licensed by the U.S. Nuclear Regulatory Commission.
- Introduce students to the safety principles and methods used to design, construct and operate a safe nuclear facility, for a specific site and application.
- Provide a basic understanding of similarities and differences in regulation of nuclear facilities versus other technologies (biotech, commercial aviation, commercial space launch, civil infrastructure).
- Provide a basic understanding the risk-informed design process and an opportunity to experience contributing in a focused area to a design project.
- Provide students with experiential knowledge in developing schedules, allocating work responsibilities, and working in teams.
- Provide students with experiential knowledge in the preparation and evaluation a Safety Analysis Report for meeting USNRC regulatory requirements, including response to Requests for Additional Information (RAIs).
- Develop a broad understanding of safety principles and methods used in design, construction and licensing of nuclear facilities.
- Develop a broad understanding of the U.S. Nuclear Regulatory Commission's regulatory requirements for nuclear facilities.
- Have awareness of key similarities and differences in regulation of nuclear facilities versus other technologies (biotech, commercial aviation, commercial space launch, civil infrastructure).
- Have awareness of the major topics covered in a Safety Analysis Report (SAR) and experience in developing and writing at least one element of a SAR.
- Have developed experience and skills in communication with the business community, the public, and regulators.
- Have developed experience and skills in establishing a project schedule, allocating work responsibilities, and working in teams.
- Have understanding of application of event identification, event frequency and consequence analysis, risk assessment and management for internally and externally initiated events in the design process.

WORKLOAD

TIME COMMITMENT

3 hours of lecture per week.

UC Berkeley Course Guide (<http://guide.berkeley.edu>)

COLLEGE OF CHEMISTRY PEER SERVICES

Made by Angela Lee, c/o 2019



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