NUC K220 Nuclear Simulator

☒ Required ☐ Elective

Catalog Description: A study of the primary and secondary systems of a Pressurized Water Reactor (PWR), with emphasis on control and protective subsystems, plant start-up, normal plant operation, and critical shut-down procedures. Reactor "accident" analyses are stressed for total reactor system comprehension.

Prerequisites: NUC K100, NUC K110/111, NUC K117, NUC K118, NUC K230, NUC K260/261

Textbook(s) or other materials: Nuclear Reator Simulator, Sherrard

Course learning outcomes/Expected performance criteria:

This capstone course utilizes a two-student, portable nuclear reactor (PWR) simulator to physically relate the various support subsystems of a nuclear plant. Students gain an important "hands-on" ability to understand the interactions of the various subsystems as well as how a reactor is actually controlled. Additionally, the theoretical principles learned in early class lectures such as thermodynamics, fluid mechanics, heat transfer, etc. are readily demonstrated and their practical interrelationships in nuclear power generation understood.

Topics covered:

COURSE TOPICS/CONTENT

		HOURS
1.	Primary Systems Overview	2
2.	Secondary Systems Overview	2
3.	Control Systems	2
4.	Control Element Drive Mechanism Control System	2
5.	Nuclear Instrumentation	2
6.	Plant Protection Systems	2
7.	General Reactor Operating Characteristics	1
8.	Estimated Critical Position Calculation	1
9.	Plant Start-up	1
	TOTAL HOURS	15

Class/Lab schedule: 1 lecture session per week

Relationship of course to Criterion 5 and Program Outcomes:

Prepared by: James R. Sherrard

NUC K221 Nuclear Simulator Lab

☒ Required ☐ Elective

Catalog Description: A study of reactor plant primary and secondary systems, control and protective systems, plant start-up, normal plan operation, and critical shut-down procedures are covered through the extensive "hands-on" utilization of a modern nuclear reactor simulator.

Prerequisites: NUC K100, NUC K110/111; NUC K117; NUC K118; NUC K230; NUC K260/261

Textbook(s) or other materials: Nuclear Reactor Simulator, Sherrard

Course learning outcomes/Expected performance criteria:

This course, utilizing a reactor plant concepts simulator, will introduce the student to basic power plant overall operation. Topics covered include primary and secondary systems, control and protective systems during plant start-up, and plant operation.

Topics covered:

COURSE TOPICS/CONTENT

		HOURS
1.	Introduction to the Concepts Simulator	5
2.	Up Power and Down Power Maneuver	5
3.	Demonstration of Control Systems	4
4.	Demonstration of Reactor Protection Operation	4
5.	ECP Start-up	4
6.	Plant Start-up	4
7.	Oral and Written Operating Exam	4
	TOTAL HOUR	30

Class/Lab schedule: 1 lab section per week

Relationship of course to Criterion 5 and Program Outcomes:

Prepared by: James R. Sherrard