Zarqa University

Faculty of : engineering
Department: energy engineering
Course title: Nuclear Energy

Prerequisite:
Instructor: Nuclear Reactions
Lecture's time: Sun/Tue/Thu
Semester: 2
Office Hours:11-12

Course description:

Nuclear Energy (906411)
Introduction to nuclear energy . Atomic and nuclear physics , the interaction of radiation and matter . Nuclear reactor operation , reactor components , nuclear cycles , neutron diffusion and moderation . Reactor shielding . fuel reprocessing and waste disposal . Reactor licensing and safety . Economics and environmental concerns .

Aims of the course:

1. Teaching Atomic and Nuclear physics
2. Teaching Radiation physics and interactions with matter
3. Teaching nuclear reactor operations components cycles and shielding .
4. Teaching unclear reactor physics and Analysis
5. Teaching fuel processing and waste disposal and nuclear safety.

Intended Learning Outcomes (ILOs):

1- Ability to know Atomic and Nuclear physics.
2- Ability to know radiation and neutron Inter actions .
3- Ability to derive and solve wave , heat, and diffusion equations.
4- Ability to know different types of nuclear reactors : fission and fusion
5- Ability to analyze and formulate nuclear fuel processing and waste disposals.

Course structures:

Week	C. Hrs	ILOs	Topics	Teaching Procedure	Assessment methods
(1-2)	6	1	Introduction to Atomic and Nuclear physics	Writing on board	Exam/Quiz
(3-4)	6	3	sols of wave and diffusion eqs in rectagular , cylindrical , and spherical reactor types.	Writing on board	Exam/Quiz/HW
(5-6)	6	2	Nuclear shielding analysis , and radiation physics interactions with matter.	Writing on board	Exam/Quiz/HW
(7-8)	6	2	materials of reactor cores and shielding .	Writing on board	Exam/Quiz
(9-10)	6	2	nuclear reactor operations , Components	Writing on board	Exam/Quiz

			, Cucles , and neutern Interactions .		
(11-12)	6	5	Fuel processing and nuclear waste disposal .	Writing on board	Exam/Quiz/HW
(13-14)	6	4	Types of nuclear reactors : fission and fusion cycles .	Writing on board	Exam/Quiz
(15-16)	6	5	Reactor licensing and safety . Economics and environmental concerns .	Writing on board	Exam/Quiz

References:

1- Nuclear Reactor Analysis , by Duderstat and others , John Wiley
2- Introduction to nuclear engineering , by Foster and Wright , sanders .

Assessment Methods:

Methods	Grade	Date
Exams : 1st, 2ad	20,20	19/3-14/5/2017
Qui3 : 1st , 2ad	5,5	21/5-25/5/2017
Final	50	4/6/2017