

1. Subject Code: **EP-421** Course Title: **Principles of Nuclear Engineering**
 2. Contact Hours : L : 3 T : 1 P : 0
 3. Examination Duration (Hrs.) : Theory : 3 Practical : 0
 4. Relative Weight : CWS : 25 PRS : 0 MTE : 25 ETE : 50 PRE : 0
 5. Credits : 4
 6. Semester : Odd
 7. Subject Area : DEC-6
 8. Pre-requisite: NIL
 9. Objective: To impart the knowledge on Nuclear Physics, Nuclear Reactions, Nuclear Reactors and safety.
 10. Details of Course :

S.No.	Contents	Contact Hours
1.	Nuclear Physics- Nuclear model of the atom - Equivalence of mass and energy - Binding - Radio activity - Half life - Neutron interactions - Cross sections. Nuclear Reactions and Reactor Materials- Mechanism of nuclear fission and fusion - Radio activity - Chain reactions - Critical mass and composition - Nuclear fuel cycles and its characteristics - Uranium production and purification - Zirconium, thorium, beryllium.	15
2.	Reprocessing- Nuclear fuel cycles - spent fuel characteristics - Role of solvent extraction in reprocessing - Solvent extraction equipment. Nuclear Reactors- Reactors - Types of fast breeding reactors - Design and construction of fast breeding reactors - heat transfer techniques in nuclear reactors - reactor shielding.	15
3.	Safety, Disposal and Proliferation- Nuclear plant safety- Safety systems - Changes and consequences of an accident - Criteria for safety - Nuclear waste - Type of waste and its disposal - Radiation hazards and their prevention - Weapons proliferation.	12
	Total	42

11. Suggested Books

S.No.	Name of Books/ Authors	Year of Publication/ Reprint
1.	Fundamentals of Nuclear Engineering by Thomas J. Cannolly/John Wiley	1978
2.	Introduction to Nuclear Power by Collier J.G., and G.F. Hewitt/Hemisphere Publishing, New York	1987
3.	Introduction to Nuclear Engineering by Lamarsh U.R./Second Edition, Addison Wesley M.A	1983
4.	Radioactive Waste - Politics, Technology and Risk by Lipschutz R.D. Ballingor, Cambridge. M.A.	1980