Module Handbook

Module Name:	Reactor Physics
Module Level:	Bachelor
Abbreviation, if applicable:	FI3241
Sub-heading, if applicable:	
Courses included in the module, if applicable:	
Semester/term:	Third Year
Module coordinator(s):	
Lecturer(s):	
Language:	Bahasa Indonesia
Classification within the curriculum:	~~General Studies / Major Subject /~~ Elective Studies
Teaching format / class hours per week during the semester:	3 hours of lecture
Workload:	3 hours of lecture
Credit Points:	3
Requirements:	FI2101 Fisika Matematika I (Mathematical Physics I) FI2201 Fisika Matematika II (Mathematical Physics II) FI2204 Fisika Modern (Modern Physics)
Learning goals/competencies:	Knowledge 1. Demonstrate knowledge of various nuclear reaction types. 2. Demonstate knowledge of solving a neutron transport equiation in nuclear reactor. 3. Demonstrate knowledge of nuclear reactor operation of various reactor types and its basic characteristics. Skill 4. Ability to analyze nuclear reactor criticality and its power distribution by applying diffusion theory. 5. Ability to analyze composition changing of core reactor during nuclear reactor operation. 6. Ability to analyze thermohydraulic aspect of nuclear by applying one channel method. 7. Ability to analyze safety aspect of nuclear reactor by applying simply model.
Content:	Neutron nuclear reactions: neutron induced nuclear fission, neutron capture,neutron scattering, evaluated nuclear data library ; neutron chain fission reactors: neutron chain fission reactions, criticality, classification of nuclear reactors ; neutron transport theory: derivation of neutron transport theory, some general approximation to solve transport theory; neutron diffusion theory: derivation of neutron diffusion theory, solution for non-multiplying media, bare homogeneous reactor, reflected reactor, control rod, numerical solution; neutron energy distribution: analytical solution in infinite medium, multigroup calculation, resonance absorbtion, multigroup diffusion theory; nuclear reactor dynamics: delayed fission neutrons, point kinetic equation, solution of point kinetic equations, reactivity feedback; fuel burn-up analysis: change in fuel composition, xenon and samarium, fuel reprocessing and refuelling, radioactive waste; introduction to thermal-hydraulic and safety analysis: temperature distribution in coolant, fuel, and cladding, pressure drop, transient phenomena, safety aspect of NPP in general, accident analysis

Study/exam achievements:	Students are considered to be competent and pass if at least get 50% of maximum mark of the exams, homework, laboratory work, and research based learning.
Forms of Media:	Slides and LCD projectors, blackboards, lab.
Literature:	1. Weston M. Stacey, Nuclear Reactor Physics, Edisi Pertama, John Wiley and Sons, 2001(Pustaka utama / main reference) 2. J. J. Duderstadt, Nuclear Reactor Analysis, John Wiley & Son, 1976 (Pustaka utama / main reference) 3. S. Glasstone & A. Sesonske, Nuclear Reactor Enginering, Van Nostrand Reinhold, 1981 (Pustaka pelengkap / complementary reference)
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