CZECH TECHNICAL UNIVERSITY IN PRAGUE
Faculty of Nuclear Sciences and Physical Engineering
Department of Nuclear Reactors

NTEC N32 - Experimental Reactor Physics Course at VR-1 Reactor

February 5 – February 9, 2024

Monday

Time	Activity
9:00 - 11:30	**Welcome meeting & Visit of the VR-1 Reactor**
11:30 - 12:30	Lunch
12:30 - 15:30	**Neutron detection**
	Neutron detection (helium and boron detectors) Study of linearity and non-linearity of neutron detection (helium and boron detectors)

Tuesday

Time	Activity
9:00 - 12:00	**Delayed neutrons detection**
	Determination of delayed neutrons properties, analyses of delayed neutron decay curves Determination of fissionable material mass using delayed neutrons detection
12:00 - 13:00	Lunch
13:00 - 16:00	**Neutron flux mapping**
	Distribution of the neutron flux in the reactor Correction on non-linearity of neutron detectors

Wednesday

Time	Activity
9:00 - 12:00	**Reactivity measurement**
	Source Jerk method Rod Drop method Source multiplication method Positive period method
12:00 - 13:00	Lunch
13:00 - 16:00	**Control rod calibration**
	Control rod calibration by inverse rate method Control rod calibration by reactimeter

Thursday

Time	Activity
9:00 - 12:00	**Study of the reactor kinetics and dynamics**
	Reactor behaviour in critical, supercritical and sub critical state with and without the external neutron source Influence temperature effects on behaviour and operation of nuclear reactor - determination of reactor void coefficient
12:00 - 13:00	Lunch
13:00 - 16:00	**Critical experiment – approaching critical state**
	Prediction of the reactor critical state by inverse rate method

Friday

Time	Activity
9:00 - 12:00	**Digital control and safety systems of the VR-1 reactor**
	Demonstration of control system functions Training of VR-1 reactor control by students
12:00 - 13:00	Lunch
13:00 - 14:00	**Test & Exit meeting**
	Test, discussion and conclusions