Study plan

Name of study plan: Fyzika plazmatu a termojaderné fúze

Faculty/Institute/Others: Department: Branch of study guaranteed by the department: Welcome page Garantor of the study branch: Program of study: Plasma Physics and Thermonuclear Fusion Type of study: Follow-up master full-time Required credits: 0 Elective courses credits: 120 Sum of credits in the plan: 120 Note on the plan:

Name of the block: Compulsory courses in the program Minimal number of credits of the block: 0 The role of the block: P

Code of the group: NMSPFPTF1 Name of the group: MDP P_FPTFN 1st year Requirement credits in the group: Requirement courses in the group: In this group you have to complete at least 14 courses Credits in the group: 0 Note on the group:

Note on the g	roup:					
Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
02AMF	Atomic and Molecular Physics David B e David B e (Gar.)	Z,ZK	4	2+2	Z	Р
02DPLA	Plasma Diagnostics Karel ezá , Pavel Kubeš, Daniel Klír Daniel Klír Karel ezá (Gar.)	Z,ZK	3	2+1	L	Р
12FIF	Inertial Fusion Physics Ond ej Klimo Ond ej Klimo Ond ej Klimo (Gar.)	Z,ZK	4	3+1	Z	Ρ
02FT	Physics of Tokamaks Ond ej Ficker Igor Jex (Gar.)	Z,ZK	4	3+1	Z	Ρ
14NMR	Materials Science for Reactors Petr Haušild Petr Haušild Petr Haušild (Gar.)	ZK	2	1P+1C	6	Ρ
14NAMA	Materials Science Petr Haušild Petr Haušild Petr Haušild (Gar.)	KZ	3	2P+1C		Р
12PFTF1	Computational Physics 1 Milan Kucha ík Milan Kucha ík Ond ej Klimo (Gar.)	Z,ZK	2	1P+1C	L	Р
02PRPLA1	Laboratory Work in Plasma Physics 1 Jana Brotánková Vojt ch Svoboda (Gar.)	Z	5	0P+3C		Р
02PRPL1	Laboratory Work in Plasma Physics 1 Jana Brotánková Vojt ch Svoboda (Gar.)	Z	2	0+2	Z	Р
02PRPLA2	Praktika fyziky plazmatu 2 Jana Brotánková, Vojt ch Svoboda Jana Brotánková Vojt ch Svoboda (Gar.)	KZ	5	0P+3C	L	Ρ
02PRPL2	Laboratory Work in Plasma Physics 2 Jana Brotánková, Vojt ch Svoboda Jana Brotánková Vojt ch Svoboda (Gar.)	KZ	2	0+2	L	Ρ
02TTJZ	Technology of Thermonuclear Facilities Ond ej Klimo, Ond ej Ficker, Radomír Pánek, Ivan uran, Michal Farník, Slavomír Entler Slavomír Entler (Gar.)	ZK	3	3+0	L	Ρ
02TPLA1	Plasma Theory 1 Petr Kulhánek Petr Kulhánek (Gar.)	Z,ZK	5	2+2	Z	Р
02TPLA2	Plasma Theory 2 Petr Kulhánek Jan Mlyná Jan Mlyná (Gar.)	Z,ZK	5	3+1	L	Р
02VUTF1	Research Project 1 Jana Brotánková	Z	6	6	Z,L	Р
02VUTF2	Research Project 2 Daniel Klír, Jana Brotánková, Vojt ch Svoboda, Ivan uran, Monika Vilémová, Libor Juha, Jakub Svoboda, Miroslav Kr s, Vladimír Scholtz, Ivan uran	КZ	8	8	L,Z	Ρ

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Code of the group: NMSPFPTF2

Name of the group: MDP P_FPTFN 2nd year

Requirement credits in the group:

Requirement courses in the group: In this group you have to complete at least 8 courses Credits in the group: 0

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
02DPTF1	Master Thesis 1 Jana Brotánková Ond ej Ficker (Gar.)	Z	10	10	Z,L	Ρ
02DPTF2	Master Thesis 2 Ivan uran Ond ej Ficker (Gar.)	Z	20	20	L,Z	Ρ
02ITERA	ITER and the accompanying programme Jana Brotánková, Ivan uran Ivan uran Ivan uran (Gar.)	ZK	2	2P+0C	L	Ρ

02PINCE	Pinches Pavel Kubeš, Daniel Klír, Ji í Limpouch Daniel Klír Daniel Klír (Gar.)	ZK	2	2P+0C	Z	Р
12PFTF2	Computational Physics 2 Ond ei Klimo Ond ei Klimo Ond ei Klimo (Gar.)	Z,ZK	2	1+1	Z	Р
02STFU1	Seminar FPTF1 Jaroslav e ovský lgor Jex (Gar.)	Z	2	0P+2S	Z	Р
02STFU2	Seminar FPTF2 Jan Mlyná Jan Mlyná Jan Mlyná (Gar.)	Z	2	0P+2S	L	Р
02TFS	Thermonuclear Fusion and Society Vojt ch Svoboda Vojt ch Svoboda (Gar.)	Z	2	2P+0C	Z	Р
Characteristics of the state of	ne courses of this group of Study Plan: Code=NMSPFPTF2 Nam	ne=MDP P_FP	TFN 2n	d year		·
	Aaster Thesis 1				7	10
	ed on a topic approved by the administrators of the programme, department and by the	dean The student	is quided b	v the project s	upervisor	
regular meetings and disc			io galaca a	, ine project e		ading common
<u> </u>	Aaster Thesis 2				7	20
-	ed on a topic approved by the administrators of the programme, department and by the	dean. The student	is quided h		-	=•
regular meetings and disc			io guiada c			
<u> </u>	TER and the accompanying programme				ZK	2
	on the ITER basic parameters and components of ITER: the superconducting magnets		fuel cycle			_
	iagnostics, schedule of construction and operation. Besides, history of the project, form					
	agriostics, schedule of construction and operation. Desides, mistory of the project, form					
	tres in the world will be presented.		onaborano	, բյ		
major fusion research cen	tres in the world will be presented.				<u>.</u>	
major fusion research cen 02PINCE	Pinches	w to generate high			ZK	2
major fusion research cen 02PINCE F This subject is focused on	Pinches physics and technology of magnetic pinches which represent the most efficient way ho	° °	n-energy de	ensity plasmas	ZK (>100	2 kJ/cm3). The
major fusion research cen 02PINCE F This subject is focused on lectures will introduce stud	Pinches physics and technology of magnetic pinches which represent the most efficient way ho dents into the basic theory, contemporary research topics, and applications of magnetic	pinches. One of th	n-energy de	ensity plasmases of the subje	ZK s (>100 ct is to der	2 kJ/cm3). The monstrate that
major fusion research cen 02PINCE F This subject is focused on lectures will introduce stud the pinch effect naturally o	Pinches physics and technology of magnetic pinches which represent the most efficient way ho dents into the basic theory, contemporary research topics, and applications of magnetic ccurs in laboratory and space plasmas and has an impact on many applications. The subj	pinches. One of th	n-energy de	ensity plasmases of the subje	ZK s (>100 ct is to der	2 kJ/cm3). The monstrate that
major fusion research cen 02PINCE F This subject is focused on lectures will introduce stud the pinch effect naturally o of fundamental processes	Pinches physics and technology of magnetic pinches which represent the most efficient way ho dents into the basic theory, contemporary research topics, and applications of magnetic ccurs in laboratory and space plasmas and has an impact on many applications. The subj in plasmas.	pinches. One of th	n-energy de	ensity plasmas es of the subje pre, contributes	ZK (>100 ct is to der to a bette	2 kJ/cm3). The monstrate that r understandin
major fusion research cen 02PINCE F This subject is focused on lectures will introduce stud the pinch effect naturally o of fundamental processes 12PFTF2 C	Pinches physics and technology of magnetic pinches which represent the most efficient way ho dents into the basic theory, contemporary research topics, and applications of magnetic ccurs in laboratory and space plasmas and has an impact on many applications. The subj in plasmas. Computational Physics 2	pinches. One of th ject Magnetic pinch	n-energy de ne objective nes, therefo	ensity plasmas es of the subje pre, contributes	ZK s (>100 ct is to der s to a better	2 kJ/cm3). The monstrate that r understandin 2
major fusion research cen 02PINCE F This subject is focused on lectures will introduce stud the pinch effect naturally o of fundamental processes 12PFTF2 C Structure of hydrodynamid	Pinches physics and technology of magnetic pinches which represent the most efficient way ho dents into the basic theory, contemporary research topics, and applications of magnetic ccurs in laboratory and space plasmas and has an impact on many applications. The subj in plasmas. Computational Physics 2 c code, representation of structured and unstructured computational meshes. Tools for c	pinches. One of th ject Magnetic pinch code debugging an	n-energy de ne objective nes, therefo d profiling,	ensity plasmas es of the subje ore, contributes Z error detectio	ZK s (>100 ct is to der s to a better ,ZK n. Code pa	2 kJ/cm3). The monstrate that r understandin 2 arallelization,
major fusion research cen 02PINCE F This subject is focused on lectures will introduce stud the pinch effect naturally o of fundamental processes 12PFTF2 C Structure of hydrodynamic memory hierarchy, superc	Pinches physics and technology of magnetic pinches which represent the most efficient way ho dents into the basic theory, contemporary research topics, and applications of magnetic ccurs in laboratory and space plasmas and has an impact on many applications. The subj in plasmas. Computational Physics 2 c code, representation of structured and unstructured computational meshes. Tools for c omputers. Euler equations on moving computational mesh. Eulerian, Lagrangian, and A	pinches. One of th ject Magnetic pinch code debugging an ALE methods, stage	n-energy de ne objective nes, therefo d profiling, gered discu	ensity plasmas es of the subje ore, contributes Z error detectio retization. Met	ZK s (>100 ct is to der s to a bette ,ZK n. Code pa hods for m	2 kJ/cm3). The monstrate that r understandin 2 arallelization, esh smoothing
major fusion research cen 02PINCE F This subject is focused on lectures will introduce stud the pinch effect naturally o of fundamental processes 12PFTF2 C Structure of hydrodynamic memory hierarchy, superc methods for conservative	Pinches physics and technology of magnetic pinches which represent the most efficient way ho dents into the basic theory, contemporary research topics, and applications of magnetic ccurs in laboratory and space plasmas and has an impact on many applications. The subj in plasmas. Computational Physics 2 c code, representation of structured and unstructured computational meshes. Tools for c omputers. Euler equations on moving computational mesh. Eulerian, Lagrangian, and A interpolations of functions between meshes. Applications in simulations of laser/target in	pinches. One of th ject Magnetic pinch code debugging an ALE methods, stage	n-energy de ne objective nes, therefo d profiling, gered discu	ensity plasmas es of the subje ore, contributes Z error detectio retization. Met	ZK s (>100 ct is to der s to a bette ,ZK n. Code pa hods for m	2 kJ/cm3). The monstrate that r understandin 2 arallelization, esh smoothing
major fusion research cen 02PINCE F This subject is focused on lectures will introduce stud the pinch effect naturally o of fundamental processes 12PFTF2 C Structure of hydrodynamic memory hierarchy, superc methods for conservative intelligence in computation	Pinches physics and technology of magnetic pinches which represent the most efficient way ho dents into the basic theory, contemporary research topics, and applications of magnetic ccurs in laboratory and space plasmas and has an impact on many applications. The subj in plasmas. Computational Physics 2 c code, representation of structured and unstructured computational meshes. Tools for c omputers. Euler equations on moving computational mesh. Eulerian, Lagrangian, and A interpolations of functions between meshes. Applications in simulations of laser/target in nal physics.	pinches. One of th ject Magnetic pinch code debugging an ALE methods, stage	n-energy de ne objective nes, therefo d profiling, gered discu	ensity plasmas es of the subje ore, contributes Z error detectio retization. Met r elastic mater	ZK (>100 ct is to der s to a better ,ZK n. Code pa hods for m rials. Metho	2 kJ/cm3). The monstrate that r understandin 2 arallelization, lesh smoothing ods of artificial
major fusion research cen 02PINCE F This subject is focused on lectures will introduce stud the pinch effect naturally o of fundamental processes 12PFTF2 C Structure of hydrodynamic memory hierarchy, superc methods for conservative intelligence in computation 02STFU1 S	Pinches physics and technology of magnetic pinches which represent the most efficient way ho dents into the basic theory, contemporary research topics, and applications of magnetic ccurs in laboratory and space plasmas and has an impact on many applications. The subj in plasmas. Computational Physics 2 c code, representation of structured and unstructured computational meshes. Tools for c omputers. Euler equations on moving computational mesh. Eulerian, Lagrangian, and A interpolations of functions between meshes. Applications in simulations of laser/target in nal physics. Seminar FPTF1	pinches. One of the ject Magnetic pinch code debugging an ALE methods, stag nteractions. Gener	n-energy de ne objective nes, therefo d profiling, gered disc alization fo	ensity plasmas es of the subje pre, contributes Z error detectio retization. Met r elastic mater	ZK (>100 ct is to der s to a better ,ZK n. Code pa hods for m rials. Metho Z	2 kJ/cm3). The monstrate that r understandin 2 arallelization, lesh smoothing ods of artificial 2
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major fusion research cen 02PINCE F This subject is focused on lectures will introduce stud the pinch effect naturally o of fundamental processes 12PFTF2 C Structure of hydrodynamic memory hierarchy, superc methods for conservative intelligence in computation 02STFU1 S Seminars based on invited fields according to the sub	Pinches physics and technology of magnetic pinches which represent the most efficient way ho dents into the basic theory, contemporary research topics, and applications of magnetic ccurs in laboratory and space plasmas and has an impact on many applications. The subj in plasmas. Computational Physics 2 c code, representation of structured and unstructured computational meshes. Tools for c omputers. Euler equations on moving computational mesh. Eulerian, Lagrangian, and A interpolations of functions between meshes. Applications in simulations of laser/target in nal physics. Seminar FPTF1 lectures given by experts in the field of research and development of thermonuclear fusio oject of their diploma thesis.	pinches. One of the ject Magnetic pinch code debugging an ALE methods, stag nteractions. Gener	n-energy de ne objective nes, therefo d profiling, gered disc alization fo	ensity plasmas es of the subje pre, contributes Z error detectio retization. Met r elastic mater o participate in	ZK (>100 ct is to der s to a better ,ZK n. Code pa hods for m rials. Metho Z seminars	2 kJ/cm3). The monstrate that r understandin 2 arallelization, iesh smoothing ods of artificial 2 of neighbourin
major fusion research cen 02PINCE F This subject is focused on lectures will introduce stud the pinch effect naturally o of fundamental processes 12PFTF2 C Structure of hydrodynamic memory hierarchy, superc methods for conservative intelligence in computation 02STFU1 S Seminars based on invited fields according to the sub 02STFU2 S	Pinches physics and technology of magnetic pinches which represent the most efficient way ho dents into the basic theory, contemporary research topics, and applications of magnetic ccurs in laboratory and space plasmas and has an impact on many applications. The subj in plasmas. Computational Physics 2 c code, representation of structured and unstructured computational meshes. Tools for c omputers. Euler equations on moving computational mesh. Eulerian, Lagrangian, and A interpolations of functions between meshes. Applications in simulations of laser/target in hal physics. Seminar FPTF1 lectures given by experts in the field of research and development of thermonuclear fusio ject of their diploma thesis. Seminar FPTF2	pinches. One of the ject Magnetic pinches. One of the ject Magnetic pinches. Code debugging an ALE methods, stage interactions. Gener	n-energy de ne objective nes, therefo d profiling, gered disc alization fo couraged to	ensity plasmas es of the subje ore, contributes Z error detectio retization. Met r elastic mater o participate in	ZK s (>100 ct is to der s to a better ,ZK n. Code pa hods for m rials. Metho Z seminars	2 kJ/cm3). The monstrate that r understandin 2 arallelization, resh smoothing ods of artificial 2 of neighbourin 2
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major fusion research cen 02PINCE F This subject is focused on lectures will introduce stud the pinch effect naturally or of fundamental processes 12PFTF2 C Structure of hydrodynamic memory hierarchy, superc methods for conservative intelligence in computation 02STFU1 S Seminars based on invited fields according to the sub 02STFU2 S Seminars based on invited fields according to the sub 02STFS T	Pinches physics and technology of magnetic pinches which represent the most efficient way ho dents into the basic theory, contemporary research topics, and applications of magnetic ccurs in laboratory and space plasmas and has an impact on many applications. The subj in plasmas. Computational Physics 2 e code, representation of structured and unstructured computational meshes. Tools for c omputers. Euler equations on moving computational mesh. Eulerian, Lagrangian, and A interpolations of functions between meshes. Applications in simulations of laser/target in hal physics. Seminar FPTF1 lectures given by experts in the field of research and development of thermonuclear fusio oject of their diploma thesis. Seminar FPTF2 lectures given by experts in the field of research and development of thermonuclear fusio oject of their diploma thesis. Thermonuclear Fusion and Society	pinches. One of the ject Magnetic pinches. One of the ject Magnetic pinches. One of the ject Magnetic pinches. Conde debugging an ALE methods, stage interactions. Gener for a students are enough and students are enough are enough and students are enough and students are enough and students are enough	n-energy de ne objective nes, therefo d profiling, gered disci alization fo couraged to couraged to	ansity plasmas as of the subje ore, contributes Z error detectio retization. Met r elastic mater o participate in o participate in	ZK k s (>100 ct is to der s to a better ,ZK n. Code pathods for m hods for m rials. Method Z a seminars Z s seminars Z z seminars	2 kJ/cm3). The monstrate that r understandir 2 arallelization, uesh smoothin ods of artificia 2 of neighbourir 2 of neighbourir 2
major fusion research cen 02PINCE F This subject is focused on lectures will introduce stud the pinch effect naturally o of fundamental processes 12PFTF2 C Structure of hydrodynamic memory hierarchy, superc methods for conservative intelligence in computation 02STFU1 S Seminars based on invited fields according to the sub 02STFU2 S Seminars based on invited fields according to the sub 02STFS T While the scientific lecture	Pinches physics and technology of magnetic pinches which represent the most efficient way ho dents into the basic theory, contemporary research topics, and applications of magnetic ccurs in laboratory and space plasmas and has an impact on many applications. The subj in plasmas. Computational Physics 2 c code, representation of structured and unstructured computational meshes. Tools for c omputers. Euler equations on moving computational mesh. Eulerian, Lagrangian, and A interpolations of functions between meshes. Applications in simulations of laser/target in hal physics. Seminar FPTF1 lectures given by experts in the field of research and development of thermonuclear fusio oject of their diploma thesis. Ceminar FPTF2 lectures given by experts in the field of research and development of thermonuclear fusio oject of their diploma thesis. Ceminar FPTF2 lectures given by experts in the field of research and development of thermonuclear fusio oject of their diploma thesis. Ceminar FPTF2 lectures given by experts in the field of research and development of thermonuclear fusio oject of their diploma thesis. Ceminar FPTF2 lectures given by experts in the field of research and development of thermonuclear fusio oject of their diploma thesis. Ceminar FPTF2 lectures given by experts in the field of research and development of thermonuclear fusio oject of their diploma thesis. Ceminar FPTF2 lectures given by experts in the field of research and development of thermonuclear fusio oject of their diploma thesis. Ceminar FPTF2 lectures given by experts in the field of research and development of thermonuclear fusio oject of their diploma thesis. Ceminar FPTF2 lectures given by experts in the field of research and development of thermonuclear fusio oject of their diploma thesis. Ceminar FUTF2 Development fusion and Society goes from the simplest to more complicated, from the known to the new, this lecture get	pinches. One of the ject Magnetic pinches. One of the ject Magnetic pinches. One of the ject Magnetic pinches. All the methods, stage and the methods, stage on the students are entered by the students are enterees are entered by the students are enterees	n-energy de ne objective nes, therefor d profiling, gered disci alization fo couraged to couraged to	ansity plasmas as of the subje ore, contributes Z error detectio retization. Met r elastic mater o participate in o participate in	ZK s (>100 ct is to der s to a better ,ZK n. Code pathods for m hods for m rials. Method Z a seminars Z seminars Z seminars Z seminars	2 kJ/cm3). The monstrate that r understandir 2 arallelization, uesh smoothin ods of artificia 2 of neighbourir 2 of neighbourir 2 es and formula
major fusion research cen 02PINCE F This subject is focused on lectures will introduce stud the pinch effect naturally or of fundamental processes 12PFTF2 C Structure of hydrodynamic memory hierarchy, superc methods for conservative intelligence in computation 02STFU1 S Seminars based on invited fields according to the sub 02STFU2 S Seminars based on invited fields according to the sub 02STFS T While the scientific lecture with their authors. It explain	Pinches physics and technology of magnetic pinches which represent the most efficient way ho dents into the basic theory, contemporary research topics, and applications of magnetic ccurs in laboratory and space plasmas and has an impact on many applications. The subj in plasmas. Computational Physics 2 e code, representation of structured and unstructured computational meshes. Tools for c omputers. Euler equations on moving computational mesh. Eulerian, Lagrangian, and A interpolations of functions between meshes. Applications in simulations of laser/target in hal physics. Seminar FPTF1 lectures given by experts in the field of research and development of thermonuclear fusio oject of their diploma thesis. Seminar FPTF2 lectures given by experts in the field of research and development of thermonuclear fusio oject of their diploma thesis. Thermonuclear Fusion and Society	pinches. One of the ject Magnetic pinch code debugging an ALE methods, stage interactions. Gener on. Students are en- on. Students are en- es from the old to the necessary or surpri	n-energy de ne objective nes, therefo d profiling, gered disci alization fo couraged to couraged to ne new. It couraged to	ansity plasmas as of the subje ore, contributes Z error detectio retization. Met r elastic mater o participate in o participate in onnects the fu	ZK s (>100 ct is to der ct is to a better , ,ZK n. Code pathods for m - hods for m - rials. Method Z a seminars Z z seminars Z sison device ends. The	2 kJ/cm3). The monstrate that r understandir 2 arallelization, uesh smoothin ods of artificia 2 of neighbourir 2 of neighbourir 2 es and formula lecture clarifie

Name of the block: Elective courses Minimal number of credits of the block: 0

The role of the block: V

Code of the group: NMSPFPTFV Name of the group: MDP P_FPTFN Optional courses Requirement credits in the group: Requirement courses in the group: Credits in the group: 0

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
12DRP	Differential Equations on Computer Richard Liska Richard Liska Richard Liska (Gar.)	Z,ZK	5	2+2	Z	V
16DNEU	Neutron Dosimetry Michal Koš ál, Ond ej Ploc Ond ej Ploc Ond ej Ploc (Gar.)	ZK	2	2+0	3	V
02EADP	Experimental data analysis in plasma physics Jakub Seidl (Gar.)	Z	3	0P+2C	L	V
12LPZ	Laser-plasma as a Source of Particles and Radiation Jaroslav Nejdl Jaroslav Nejdl Jaroslav Nejdl (Gar.)	ZK	2	2+0	Z	V
02ZLSTF2	Summer School of Plasma Physics and Fusion Physics 2 Vojt ch Svoboda (Gar.)	Z	1	1týd.	L	V
01MMNS	Mathematical Modelling of Non-linear Systems Michal Beneš Michal Beneš Michal Beneš (Gar.)	ZK	3	1P+1C	Z	V

		1	1	1		
12NIPL	Low Temperature Plasmas and Discharges Jaroslav Nejdl, Michal Nevrkla Jaroslav Nejdl Jaroslav Nejdl (Gar.)	Z,ZK	4	4	Z	V
12OSP	Optical Spectroscopy Martin Michl Martin Michl (Gar.)	КZ	2	2+0	L	V
02PMPL	Computer Modelling of Plasma Radek Plašil Radek Plašil (Gar.)	Z,ZK	3	2+1	L	V
12POEX	Computer Control of Experiments Miroslav ech Miroslav ech (Gar.)	Z	2	2+0	L	V
12SFMC1	Computer Simulations in Many-particle Physics 1 Milan P edota Richard Liska Richard Liska (Gar.)	Z,ZK	4	3+1	Z	V
12SFMC2	Computer Simulations in Many-particle Physics 2	ZK	2	2+0	L	V
16REL	Milan P edota, Karel Houfek Richard Liska (Gar.) Radiation Effects in Matter	ZK	2	2+0	Z	v
01SUP	Kate ina Pila ová Kate ina Pila ová Kate ina Pila ová (Gar.) Start-up Project	КZ	2	2P+0C		v
11SUPR	P emysl Rubeš P emysl Rubeš P emysl Rubeš (Gar.) Superconductivity and Low Temperature	ZK	4	4	Z	v
16ZIVO	Zden k Jan , Martin Ledinský Martin Ledinský Martin Ledinský (Gar.) Introduction to Environment	KZ	2	2+0	1	v
	Hana Pr šová Hana Pr šová Hana Pr šová (Gar.) Topics in Magnetic Confinement Fusion			-		
02PMCF	Ond ej Ficker Ond ej Ficker (Gar.)	KZ	2	0+2	L	V
16ZJT	Nuclear Technology Devices Tomáš echák, Kamil Augsten Kamil Augsten Tomáš echák (Gar.)	ZK	2	2+0	1	V
02ZLSTF1	Winter School of Plasma Physics and Fusion Physics 1 Vojt ch Svoboda (Gar.)	Z	1	1týd.	Z	V
Characteristics of the	courses of this group of Study Plan: Code=NMSPFPTFV Nam	e=MDP P_FF	PTFN Op	tional co	urses	
12DRP Dif	ferential Equations on Computer			Z	,ZK	5
parabolic and elliptic equation stability, convergence, modifi	s, analytical methods; Ordinary differential equations, numerical methods, Runge-Kutta is, posedness of differential equaitons; Partial differential equations, numerical solution, i ed equation, diffusion, dispersion; Conservation laws and their numerical solution, sha ion in Matlab system for numerics and Maple for analysis of schemes.	finite difference m	ethods, diffe	rence schem	nes, order of a	pproximation
	utron Dosimetry				ZK	2
	eactions with neutrons, methods based on recoiled nuclei, the time-of-flight method, no	eutron selectors a	and monoch	1	1	
of integrating neutron dosime	etry, possibilities of use of various methods, calibration of neutron dosimeters and othe	er dose and dose	rate measu	ring instrum	ents.	
	perimental data analysis in plasma physics				Z	3
•	provide students with the opportunity to gain practical experience by solving projects in magnetic plasma confinement, using various diagnostic systems (microwaves, visible s					, ,
	pply Bayesian approaches, neural networks, and computations on graphics cards to c					•
-	of applying forward and backward models in plasma diagnostics. This approach mimi	cs workflows com	mon in rese	earch and de	velopment pr	ojects, wher
	a method for obtaining a certain type of information from measured data.					
	ser-plasma as a Source of Particles and Radiation	an apparation of a			ZK	2
	vith physical principles of interaction of intense laser beams with matter with a stress of ations of these sources. After definition of basic quantities and description of interaction of					
	neration of single attosecund pulseswill be explained followed by plasma-based x-ray la				• •	0
с с	rd x-rays from relativistic laser beams, electron and ion acceleration and selected inte					
02ZLSTF2 Su	mmer School of Plasma Physics and Fusion Physics 2				Z	1
Regular international "Studen on his research.	nt Summer School of Plasma and Fusion Physics" should help students to improve th	eir communicatio	n skills. Eac	h participatir	ng student pre	esents a talk
01MMNS Ma	thematical Modelling of Non-linear Systems				ZK	3
	terms and results of the theory of finite- and infinitedimensional dynamical systems g and part is devoted to the explanation of basic results of the fractal geometry dealing v					scription of
	w Temperature Plasmas and Discharges	le recombination	Drahmaatr		,ZK	4
-	basic concepts and relations; elastic scattering; ionization and excitation; three-partic gas. Gas in thermodynamic equilibrium. Ionized gas in electric field. Phenomena on			-	-	
-	cs. Glow discharge. Self-sustaining D.C. arc discharge. Low pressure discharge with h tical Spectroscopy	eated cathode. E	lectrical pro		KZ	2
Basics of spectroscopic beha	aviour of atoms and molecules. Elementary experimental techniques for optical spectr	oscopy.				
	mputer Modelling of Plasma acquaint the students with basic methods of computer modelling in physics and to app	olv these techniqu	ies to the st		Z,ZK	3 in both
low-temperature and high-ten	mperature plasmas.	,		1		
	mputer Control of Experiments computers, microcomputers. Hardware: computer-experiment interconnection (interfa	aces RS232C IFF	488. A/D ai	 nd D/A conve	Z erters. sensor	2 s. drivers.
etc.) Software: operating sys	tems for control of experiments (real time OS, multitasking, multiuser). Basic theory of					
	P protocols. Control of experiments via Internet. mputer Simulations in Many-particle Physics 1			7	,ZK	4
Computer simulation types a	nd possibilities, classical continuous and lattice model systems, principles of the Mon		-	1		
	ard-Jones liquid, realization of simulations and measurement, simulations in various th mputer Simulations in Many-particle Physics 2	hermodynamic er	sembles.		ZK	2
1	Carlo and molecular dynamics and their applications to various problems: critical phere	nomena, complex	molecules,			
coefficients, kinetic MC, optir	nalization problems, quantum MC, ab initio simulations, Car-Parrinello method.					

16REL Radiation Effects in Matter	ZK	2
History of radiolysis, track, stages of radiolysis, reaction kinetics, radiation chemical yield, experiments in radiolysis, classical methods, pulse radiolys	sis, EPR, primary	products of
radiolysis, excited states, solvated electrons, free radicals, radiolysis of gases, water, water solutions, organic liquids, radiolysis of solid materials, ion	ic crystals, polyn	ners, glasses,
metals and alloys, radiation technology, sterilisation, crosslinking and degradation of polymers, treatment of foods.		
01SUP Start-up Project	KZ	2
11SUPR Superconductivity and Low Temperature	ZK	4
The subject of course is: low temperature physics, including cooling methods, low temperature technique, and measurement of low temperatures; ma	acroscopic quant	um phenomena
in quantum fluids (superfluidity and superconductivity), quantum crystals and diffusion, mesoscopic phenomena in electron systems, quantum Hall e	ffects, Coulomb I	olockade and
single electron transistor.		
16ZIVO Introduction to Environment	KZ	2
Ozone layer reduction, global warming (greenhouse effect), acid rain, smog, chemicalization, astrophysical theory, cosmic rays, primordial elements,	atmosphere con	tamination,
measuring of imissions and emissions, hydrosphere, waste dumping, fossil fuel, alternative sources, solar energy, water energy, wind energy, geother	mal energy, biom	ass combustion,
hydrogen energetic, galvanic and fuel couples, principle of sustainable development		
02PMCF Topics in Magnetic Confinement Fusion	KZ	2
This course provides an opportunity to students interested in magnetic confinement fusion to enhance their knowledge of fusion physics and technol	ogy by special to	pics that are not
covered by the mainstream courses. At the same time, it is a platform where students can meet young research scientists from the COMPASS tokam	ak. In the end of	the course
students are expected to present results of their own research task.		
16ZJT Nuclear Technology Devices	ZK	2
Basic scheme of nuclear reactor and nuclear power plant, chain fission reaction development, factors influencing reactivity, internal fuel cycle, main c	components of nu	iclear energetic
reactor, most important reactor types, linear high-voltage accelerators, linear high-frequency accelerators, accelerators based on cyclotron, microtror	n, betatron, electi	ron and proton
synchrotrons, electron and ion sources for accelerators, targets.		
02ZLSTF1 Winter School of Plasma Physics and Fusion Physics 1	Z	1
Regular international "Student Winter School of Plasma and Fusion Physics" should help students to improve their communication skills. Each partic	ipating student p	resents a talk on
his research.		

List of courses of this pass:

Code	Name of the course	Completion	Credits
01MMNS	Mathematical Modelling of Non-linear Systems	ZK	3
The course cons	ists of basic terms and results of the theory of finite- and infinitedimensional dynamical systems generated by evolutionary differential	equations, and de	scription of
bifuro	cations and chaos. Second part is devoted to the explanation of basic results of the fractal geometry dealing with attractors of such dy	namical systems.	
01SUP	Start-up Project	KZ	2
02AMF	Atomic and Molecular Physics	Z,ZK	4
	This lecture course provides a theoretical introduction to atomic and molecular physics.	, ,	I
02DPLA	Plasma Diagnostics	Z,ZK	3
he goal of the lect	ure is to obtain the overview of measurements of basic parameters of hot plasma and their components - density, temperature, electri	omagnetic fields, ra	adiation and
energy	and temporal and spatial distribution. The students will acquaint with principles, methodic, demonstration, examples and application of	of basic diagnostics	6.
02DPTF1	Master Thesis 1	Z	10
The diploma proje	ct is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the pro	ect supervisor duri	ng common
	regular meetings and discussions.		
02DPTF2	Master Thesis 2	Z	20
The diploma proje	c is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the pro	ect supervisor duri	ng common
	regular meetings and discussions.		
02EADP	Experimental data analysis in plasma physics	Z	3
The goal of the co	urse is to provide students with the opportunity to gain practical experience by solving projects in the field of data science. Several ta	sks focused on ana	alvzing data
from fusion experi	ments with magnetic plasma confinement, using various diagnostic systems (microwaves, visible spectroscopy, infrared cameras, electr	ical probes, etc.), q	ive students
	n how to apply Bayesian approaches, neural networks, and computations on graphics cards to obtain the required information about t		
	dvantages of applying forward and backward models in plasma diagnostics. This approach mimics workflows common in research an		
It introduces the a	the requirement is to design a method for obtaining a certain type of information from measured data.		jects, where
02FT	Physics of Tokamaks	Z,ZK	4
	on physics of thermonuclear fusion in the magnetic confinement of tokamaks. The course is focused on the physics context, terminology	1 '	· ·
	dents can substantially improve their understanding of physics background as well as their capacity to search for information and to wo		
	literature.		
02ITERA	ITER and the accompanying programme	ZK	2
-	rn details on the ITER basic parameters and components of ITER: the superconducting magnets, vacuum pumping, fuel cycle, cryopl		-
	lasma diagnostics, schedule of construction and operation. Besides, history of the project, forms of international collaboration, project		•
6001101100, 11 21 Cp	major fusion research centres in the world will be presented.		
02PINCE	Pinches	ZK	2
	cused on physics and technology of magnetic pinches which represent the most efficient way how to generate high-energy density pl		-
•	duce students into the basic theory, contemporary research topics, and applications of magnetic pinches. One of the objectives of the		,
	turally occurs in laboratory and space plasmas and has an impact on many applications. The subject Magnetic pinches, therefore, contri	-	
	of fundamental processes in plasmas.		5
02PMCF	Topics in Magnetic Confinement Fusion	KZ	2
	les an opportunity to students interested in magnetic confinement fusion to enhance their knowledge of fusion physics and technolog		that are not
	mainstream courses. At the same time, it is a platform where students can meet young research scientists from the COMPASS tokar		
	students are expected to present results of their own research task.		

02PMPL	Computer Modelling of Plasma	Z,ZK	3
The goal of the	lecture is to acquaint the students with basic methods of computer modelling in physics and to apply these techniques to the study o	f physical processe	s in both
	low-temperature and high-temperature plasmas.		0
02PRPL1	Laboratory Work in Plasma Physics 1 cture is performing experimental work on advanced plasma laboratory experiments: either on a fusion device - the GOLEM tokamak,		2
The goal of the le	for training of fusion oriented plasma physics PlasmaLab@CTU. The goal is also obtaining experience with the basics of scientif	-	laboratory
02PRPL2	Laboratory Work in Plasma Physics 2	KZ	2
	cture is performing experimental work on advanced plasma laboratory experiments: either on a fusion device - the GOLEM tokamak,	1	
	for training of fusion oriented plasma physics PlasmaLab@CTU. The goal is also obtaining experience with the basics of scientif	ic work.	
02PRPLA1	Laboratory Work in Plasma Physics 1	Z	5
The goal of the le	cture is performing experimental work on advanced plasma laboratory experiments: either on a fusion device - the GOLEM tokamak,		laboratory
	for training of fusion oriented plasma physics PlasmaLab@CTU. The goal is also obtaining experience with the basics of scientif		-
02PRPLA2	Praktika fyziky plazmatu 2	KZ	5
The goal of the le	cture is performing experimental work on advanced plasma laboratory experiments: either on a fusion device - the GOLEM tokamak, for training of fusion oriented plasma physics PlasmaLab@CTU. The goal is also obtaining experience with the basics of scientif	-	laboratory
02STFU1	Seminar FPTF1	Z	2
	i invited lectures given by experts in the field of research and development of thermonuclear fusion. Students are encouraged to participation	. –	
	fields according to the subject of their diploma thesis.		
02STFU2	Seminar FPTF2	Z	2
Seminars based or	invited lectures given by experts in the field of research and development of thermonuclear fusion. Students are encouraged to participation of the second	ate in seminars of n	eighbouring
	fields according to the subject of their diploma thesis.		
02TFS	Thermonuclear Fusion and Society	<u> </u>	2
	lecture goes from the simplest to more complicated, from the known to the new, this lecture goes from the old to the new. It connects the texplains the logics behind the direction of the controlled thermonuclear fusion, including the necessary or surprising mistakes, and other the second se		
	sion in the society, including the role of popularization, and the role of fusion in the future energy resources scheme. The fusion news		
02TPLA1	Plasma Theory 1	Z,ZK	5
-	e lecture will be devoted to the individual particles motion in Lagrange and Hamilton formalism for both relativistic and non-relativistic	1 ' 1	-
be solved in the fra	ame of adiabatic approach. The second part of the lecture will be devoted to magnetohydrodynamics, especially such phenomena as	helicity and helical	structures,
	magnetic field-lines reconnection, MHD dynamo and others.		
02TPLA2	Plasma Theory 2	Z,ZK	5
	lecture will be devoted to plasma waves and instabilities. General recipes of obtaining the disperse relation will be discussed, especia	-	
transform. Magnet	bacoustic waves, electromagnetic waves, and basic instabilities will be treated in detail. The second part of the lecture will be devoted e. g. transport phenomena, and microinstabilities such as Landau damping.	to statistical plasma	a approacn,
02TTJZ	Technology of Thermonuclear Facilities	ZK	3
	uces students to the basic technologies of thermonuclear devices. The aim of the course is to provide students with basic technical ir	I	-
	usion experimental facilities. The course provides an overview of solutions, technical problems, possibilities and limits of fusion equip		
02VUTF1	Research Project 1	Z	6
The research proje	ct is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the pro	ject supervisor duri	ng common
	regular meetings and discussions.		
02VUTF2	Research Project 2	KZ	8
The research proje	ect is based on a topic approved by the administrators of the programme, department and by the dean. The student is guided by the pro regular meetings and discussions.	ject supervisor duri	ng common
02ZLSTF1	Winter School of Plasma Physics and Fusion Physics 1	7	1
	al "Student Winter School of Plasma and Fusion Physics" should help students to improve their communication skills. Each participa	ating student preser	nts a talk on
	his research.		
02ZLSTF2	Summer School of Plasma Physics and Fusion Physics 2	Z	1
Regular internatio	nal "Student Summer School of Plasma and Fusion Physics" should help students to improve their communication skills. Each partic	ipating student pres	sents a talk
	on his research.		
11SUPR	Superconductivity and Low Temperature Irse is: low temperature physics, including cooling methods, low temperature technique, and measurement of low temperatures; maci		4
	s (superfluidity and superconductivity), quantum crystals and diffusion, mesoscopic phenomena in electron systems, quantum Hall ef		
	single electron transistor.		
12DRP	Differential Equations on Computer	Z,ZK	5
Ordinary differentia	el equations, analytical methods; Ordinary differential equations, numerical methods, Runge-Kutta methods, stability; Partial differential		, hyperbolik,
	ic equations, posedness of differential equaitons; Partial differential equations, numerical solution, finite difference methods, difference so		
stability, converge	nce, modified equation, diffusion, dispersion; Conservation laws and their numerical solution, shallow water equations, Euler equation	ns, Lagrangian mel	thods, ALE
12FIF	methods; Practical computation in Matlab system for numerics and Maple for analysis of schemes.	Z,ZK	4
	Inertial Fusion Physics n to introduce to the topic of inertial confinement fusion (ICF). Physical processes, which take place during the individual stages befo	1 1	
	problems (instabilities etc.), which make the inertial confinement and the ignition of the fuel more demanding are discussed and their po	-	
	New projects in the field of ICF including some preliminary reactor designes are reviewed.		
12LPZ	Laser-plasma as a Source of Particles and Radiation	ZK	2
-	acquinted with physical principles of interaction of intense laser beams with matter with a stress on generation of secondary sources		
1.	ted applications of these sources. After definition of basic quantities and description of interaction of bound electron with low frequency fi		•
	on and generation of single attosecund pulseswill be explained followed by plasma-based x-ray lasers and radiation from hot plasma. I of generation hard x-rays from relativistic laser beams, electron and ion acceleration and selected interdisciplinary applications of th		
12NIPL	Low Temperature Plasmas and Discharges	Z,ZK	4
	enomena; basic concepts and relations; elastic scattering; ionization and excitation; three-particle recombination. Brehmsstrahlung; r	· · ·	
	ially ionized gas. Gas in thermodynamic equilibrium. Ionized gas in electric field. Phenomena on electrodes. Breakdown of gas in D.C	•	
d	ischarges; V-A charakteristics. Glow discharge. Self-sustaining D.C. arc discharge. Low pressure discharge with heated cathode. Election of the second s	ctrical probes.	

12OSP	Optical Spectroscopy	KZ	2
	Basics of spectroscopic behaviour of atoms and molecules. Elementary experimental techniques for optical spectroscopy	•	'
12PFTF1	Computational Physics 1	Z,ZK	2
The course is give	ing an overview of some of the well-known computational physics methods in various fields of physics. The first part concentrates on	particle simulation	n methods -
molecular dynami	cs, Monte Carlo method and other methodsof solving the particle transport in self-consistent fields (e.g. Particle in Cell method in plas	ma physics). The	second par
concentrates on n	nethods of solving Maxwell equations and in particular on the finite difference, finite elements methods and the method of moments. A	n introduction to a	application c
	computational physics methods in quantum physics (Hartree-Fock method, density functional theory) is also given.		
12PFTF2	Computational Physics 2	Z,ZK	2
Structure of hydr	odynamic code, representation of structured and unstructured computational meshes. Tools for code debugging and profiling, error de	stection. Code par	allelization,
memory hierarchy	, supercomputers. Euler equations on moving computational mesh. Eulerian, Lagrangian, and ALE methods, staggered discretization.	Methods for mes	h smoothing
methods for cons	ervative interpolations of functions between meshes. Applications in simulations of laser/target interactions. Generalization for elastic	materials. Method	ls of artificia
	intelligence in computational physics.		
12POEX	Computer Control of Experiments	Z	2
Introduction. Bas	sic design of computers, microcomputers. Hardware: computer-experiment interconnection (interfaces RS232C,IEE488, A/D and D/A	converters, sense	ors, drivers,
etc.) Software: op	perating systems for control of experiments (real time OS, multitasking, multiuser). Basic theory of control systems. Programming lang	juages for control	(assembler
	C, etc.) Introduction to TCP/IP protocols. Control of experiments via Internet.		
12SFMC1	Computer Simulations in Many-particle Physics 1	Z,ZK	4
Computer simula	ion types and possibilities, classical continuous and lattice model systems, principles of the Monte Carlo and molecular dynamics me	thods, the Ising n	nodel, model
	of hard spheres and of Lennard-Jones liquid, realization of simulations and measurement, simulations in various thermodynamic er	nsembles.	
12SFMC2	Computer Simulations in Many-particle Physics 2	ZK	2
Advanced method	s of Monte Carlo and molecular dynamics and their applications to various problems: critical phenomena, complex molecules, non-equ	ilibrium phenome	na, transpoi
	coefficients, kinetic MC, optimalization problems, quantum MC, ab initio simulations, Car-Parrinello method.		
14NAMA	Materials Science	KZ	3
	Introduction to the Materials Science.		
14NMR	Materials Science for Reactors	ZK	2
	Materials for classical and fusion reactors		1
16DNEU	Neutron Dosimetry	ZK	2
Methods based or	nuclear reactions with neutrons, methods based on recoiled nuclei, the time-of-flight method, neutron selectors and monochromators		ods, method
	rating neutron dosimetry, possibilities of use of various methods, calibration of neutron dosimeters and other dose and dose rate mea		
16REL	Radiation Effects in Matter	ZK	2
History of radio	ysis, track, stages of radiolysis, reaction kinetics, radiation chemical yield, experiments in radiolysis, classical methods, pulse radiolys	is, EPR, primary	products of
radiolysis, excite	d states, solvated electrons, free radicals, radiolysis of gases, water, water solutions, organic liquids, radiolysis of solid materials, ionic	crystals, polyme	rs, glasses,
	metals and alloys, radiation technology, sterilisation, crosslinking and degradation of polymers, treatment of foods.		
16ZIVO	Introduction to Environment	KZ	2
Ozone layer red	ution, global warming (greenhouse effect), acid rain, smog, chemicalization, astrophysical theory, cosmic rays, primordial elements,	atmosphere cont	amination,
	sions and emissions, hydrosphere, waste dumping, fossil fuel, alternative sources, solar energy, water energy, wind energy, geotherma		
-	hydrogen energetic, galvanic and fuel couples, principle of sustainable development		
16ZJT	Nuclear Technology Devices	ZK	2
	nuclear reactor and nuclear power plant, chain fission reaction development, factors influencing reactivity, internal fuel cycle, main cor	nponents of nucle	ar energetic
	portant reactor types, linear high-voltage accelerators, linear high-frequency accelerators, accelerators based on cyclotron, microtron,	•	•
	synchrotrons, electron and ion sources for accelerators, targets.		

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