Study plan

Name of study plan: Učitelství fyziky pro střední školy

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Master Continuation Programme in Physics Education
Type of study: Follow-up master combined
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: PP

Code of the group: NMSPUCIFY1
Name of the group: NMS P_UCIFY 1. ročník
Requirement credits in the group:
Requirement courses in the group: In this group you have to complete at least 13 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
15AMV	**Activating Teaching Methods** *David Šarboch, Petr Distler, Věra Krajčová* ***Petr Distler*** *Petr Distler (Gar.)*	KZ	4	12B		PP
02UAOR	**Astrophysics and General Relativity** *Boris Tomášik* ***Boris Tomášik*** *Boris Tomášik (Gar.)*	ZK	3	8B	L	PP
02UDIF1	**Physics Didactics 1** *Věra Krajčová* ***Boris Tomášik*** *Věra Krajčová (Gar.)*	Z,ZK	6	16B	Z	PP
02UDIF2	**Physics Didactics 2** *Věra Krajčová* ***Boris Tomášik*** *Věra Krajčová (Gar.)*	Z,ZK	6	16B	L	PP
02UINT	**Didactics of Integrated Science Education** *Boris Tomášik, Maksym Dreval* ***Boris Tomášik*** *Boris Tomášik (Gar.)*	KZ	6	18B	Z	PP
02UHF	**History of Physics and Technology Applications** *Radka Vozábová* ***Boris Tomášik*** *Radka Vozábová (Gar.)*	KZ	3	8B	L	PP
32MC-K-ODID-01	**General Didactics** *David Vaněček, Kateřina Mrázková* ***David Vaněček*** *David Vaněček (Gar.)*	Z,ZK	5	16B		PP
32MC-K-PEDO-01	**General Pedagogy** *Daniela Nováková, Martin Kursch* ***Daniela Nováková*** *Martin Kursch (Gar.)*	Z,ZK	5	16B		PP
01PTZ	**Support for Talented Pupils** *Lubomíra Dvořáková* ***Lubomíra Dvořáková*** *Lubomíra Dvořáková (Gar.)*	KZ	4	12B		PP
02UPSP	**Practicum in School Physics Experiments** *Věra Krajčová, Radka Vozábová* ***Boris Tomášik*** *Radka Vozábová (Gar.)*	KZ	3	8B	Z	PP
32ME-K-PRSK-01	**Presentation and Communication Skills**	ZK	4	16B		PP
02UPPP	**Introduction to Teaching Practice** ***Boris Tomášik*** *Věra Krajčová (Gar.)*	Z	6	16B	L	PP
32MC-K-PSEP-01	**Psychology in Educational Process** *Lenka Emrová, Eva Šírová* ***Eva Šírová*** *Lenka Emrová (Gar.)*	Z,ZK	5	16B		PP

Characteristics of the courses of this group of Study Plan: Code=NMSPUCIFY1 Name=NMS P_UCIFY 1. ročník

15AMV	Activating Teaching Methods	KZ	4
The student will become familiarboth theoretically and especially practicallywith activation methods used in science education, their significance, and their effective implementation in the teaching and learning process. Based on the instructional objective, the student selects an appropriate activation method and designs a segment of a lesson, including its reflection and evaluation.			
02UAOR	Astrophysics and General Relativity	ZK	3
The course provides a basic overview of concepts in astronomy, key topics in astrophysics, and selected topics from general relativity. It is designed as an introduction for future teachers who, after completing the course, will be better equipped to understand the subject matter and independently study further topics.			

02UDIF1	Physics Didactics 1	Z,ZK	6
The course provides an introduction to and practical training in methodological approaches to teaching physics in secondary schools. It covers diverse approaches to science education and to physics instruction specifically. Emphasis is placed on lesson preparation and delivery with a focus on engaging students. Students will practice both student-led and demonstration experiments, as well as laboratory work. The course highlights interesting and essential topics in mechanics, molecular physics, and oscillations and waves, tailored to the secondary school level.			
02UDIF2	Physics Didactics 2	Z,ZK	6
This course builds upon Physics Didactics I. It offers practical training in methodological procedures for teaching physics in secondary schools. The course introduces inquiry-based learning and laboratory work in physics. It emphasizes learning in context and the application of physics knowledge in practice. Student motivation and possibilities for formative assessment in physics education are addressed. The course focuses on engaging and essential topics in electricity and magnetism, optics, and modern physics at the secondary school level.			
02UINT	Didactics of Integrated Science Education	KZ	6
This course explores cross-cutting topics from the perspective of natural sciences. While mathematics, physics, and chemistry are traditionally taught as separate subjects in schools, their content frequently overlaps and intersects. In such cases, collaboration among teachers across disciplines is beneficial. The course will present several topics suitable for building interdisciplinary relationships and fostering cooperation among teachers within a school. Students will be introduced to tandem teaching and project-based learning methods.			
02UHF	History of Physics and Technology Applications	KZ	3
Students will become acquainted with key experiments and discoveries that have significantly contributed to the development of our current understanding of the natural world. This knowledge can be effectively incorporated into physics teaching as a supplement to the curriculum. Presenting interesting facts about experiments, prominent scientists, and their applications will enrich the instruction and enhance student motivation.			
32MC-K-ODID-01	General Didactics	Z,ZK	5
32MC-K-PEDO-01	General Pedagogy	Z,ZK	5
The course focuses on basic knowledge of educational phenomena, processes, laws, principles, categories, and theories that form the basis of pedagogical thinking. Education and training will be discussed in the context of pedagogical sciences in connection with changes in the Czech education system over the past twenty years, namely in relation to curricular reform, diversification of the system, alternative educational concepts, and changes in vocational education.			
01PTZ	Support for Talented Pupils	KZ	4
02UPSP	Practicum in School Physics Experiments	KZ	3
The aim of the course is to acquaint students with the fundamental types of experiments and their effective integration into secondary school physics instruction. The course also introduces the technical equipment of the physics laboratory and preparation room. Pre-service teachers will learn to prepare, appropriately incorporate into lessons, and clearly explain core experiments in mechanics, oscillations and waves, thermodynamics, electricity and magnetism, and optics. The Practicum in School Physics Experiments complements the theoretical foundations provided in Physics Didactics 1 and Physics Didactics 2.			
32ME-K-PRSK-01	Presentation and Communication Skills	ZK	4
02UPPP	Introduction to Teaching Practice	Z	6
The course focuses on preparing students for lesson planning before they begin their teaching practice.			
32MC-K-PSEP-01	Psychology in Educational Process	Z,ZK	5
The course guides students toward future applications of psychological theory in practical teaching activities. It facilitates the acquisition and development of specific skills, particularly in the area of personal development and understanding the personality traits of others. Furthermore, the course presents selected psychological knowledge necessary for understanding and guiding the educational process. This mainly concerns the characteristics and development of cognitive, motivational, and emotional processes, the psychological characteristics of individuals, and their changes in individual developmental stages, especially during adolescence.			

Code of the group: NMSPUCIFY2
Name of the group: NMS P_UCIFY 2. ročník
Requirement credits in the group:
Requirement courses in the group: In this group you have to complete at least 10 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
02UPDP	**Didactic-Pedagogical Project of the Diploma Thesis** ***Boris Tomášik*** *Boris Tomášik (Gar.)*	Z	2	4B	Z	PP
02UDIP	**Diploma Thesis** ***Boris Tomášik*** *Boris Tomášik (Gar.)*	Z	12	2B	L	PP
02UICT	**ICT in Natural Science Education** *Věra Krajčová, Maksym Dreval, Lukáš Tomaník* ***Boris Tomášik*** *Věra Krajčová (Gar.)*	KZ	3	8B	Z	PP
32MC-K-OSPN-01	**Personality: Pathology and Normality**	KZ	3	8B		PP
32MC-K-SVZP-02	**Education of Pupils with Special Educational Needs in Science Subjects**	ZK	4	12B		PP
02UPPS	**Direct School-Based Teaching Practice** ***Boris Tomášik*** *Věra Krajčová (Gar.)*	Z	15	320XH	Z	PP
02URPP	**Reclection on Teaching Practice** ***Boris Tomášik*** *Věra Krajčová (Gar.)*	Z	3	6B	L	PP
32MC-K-PEDS-01	**Social Pedagogy**	ZK	3	8B		PP
02USTA	**Current Trends in the Development and Application of Natural Sciences** ***Boris Tomášik*** *Boris Tomášik (Gar.)*	Z	6	16B	L	PP
32MC-K-SKMN-01	**School Management**	ZK	3	8B		PP

Characteristics of the courses of this group of Study Plan: Code=NMSPUCIFY2 Name=NMS P_UCIFY 2. ročník

02UPDP	Didactic-Pedagogical Project of the Diploma Thesis	Z	2
Students will become familiar with the principles of writing a masters thesis, conduct a literature review and research other relevant sources, and propose the structure and methodology of their work. They will also develop and present the theoretical didactic-pedagogical section of their thesis. These outcomes will be presented to peers and defended during the presentation.			
02UDIP	Diploma Thesis	Z	12
Under expert supervision, students will prepare the practical part of their diploma thesis. At the end of the semester, they will present their work to fellow students and defend their approach.			
02UICT	ICT in Natural Science Education	KZ	3
This course is designed for students in teacher education and introduces methods of working with ICT and their application in teaching mathematics, physics, chemistry, and natural sciences in general, taking into account the students specialization. In addition to familiarizing students with current ICT options, the course strengthens their competencies in digital technologies and communication.			
32MC-K-OSPN-01	Personality: Pathology and Normality	KZ	3
32MC-K-SVZP-02	Education of Pupils with Special Educational Needs in Science Subjects	ZK	4
02UPPS	Direct School-Based Teaching Practice	Z	15
Before beginning the teaching practice, the student completes an introductory course in teaching practice (Introduction to Teaching Practice). The first phase of direct practice primarily involves classroom observation at a specific school and the preparation of observation protocols. In the following phase, students actively participate in teaching and engage in school-related activities. The student carries out the practice at a designated school for one semester, either two days per week or one day per week over the course of the school year. At least 90 hours must be spent in the classroom, of which 45 hours involve actual teaching, either independently or in pairs. The full 15 ECTS credits also account for time spent on lesson preparation, writing observation protocols, and similar activities, amounting to a total of 450 hours.			
02URPP	Reclection on Teaching Practice	Z	3
This practically oriented course places special emphasis on collaboratively seeking effective solutions to common challenges in teaching practice, as well as on strategies for managing dynamic changes in contemporary education. The instruction is primarily based on creating a safe and supportive environment for reflecting on ones own learning dispositions, sharing and processing emotions and challenging professional topics, including the presentation and communication of students initial pedagogical outcomes. Methods incorporated include structured discussions, feedback interviews, and mentoring.			
32MC-K-PEDS-01	Social Pedagogy	ZK	3
02USTA	Current Trends in the Development and Application of Natural Sciences	Z	6
This course is designed for teacher education students. It introduces students to the latest research directions in the natural sciences. Emphasis is placed on developing professional qualifications and interdisciplinary connections. The course is delivered through specialized seminars, which also include guest lectures from external experts, and features a field trip to a specialized research facility.			
32MC-K-SKMN-01	School Management	ZK	3

Name of the block: Compulsory elective courses
Minimal number of credits of the block: 0
The role of the block: PV

Code of the group: NMSPUCIFYPV
Name of the group: NMS P_UCIFY povinně volitelné předměty
Requirement credits in the group:
Requirement courses in the group: In this group you have to complete at least 2 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
32MC-K-PSHY-01	**Psycho-hygiene Aspects of Teaching Profession**	Z,ZK	3	8B		PV
32MC-K-SPKO-01	**Social and Pedagogical Communication**	KZ	3	8B		PV
32MC-K-TECR-01	**Impacts of Information Technology on Society**	Z,ZK	3	8B		PV
32MC-K-RIZZ-01	**Risk Behavior of Pupils**	KZ	3	8B		PV

Characteristics of the courses of this group of Study Plan: Code=NMSPUCIFYPV Name=NMS P_UCIFY povinně volitelné předměty

32MC-K-PSHY-01	Psycho-hygiene Aspects of Teaching Profession	Z,ZK	3
32MC-K-SPKO-01	Social and Pedagogical Communication	KZ	3
32MC-K-TECR-01	Impacts of Information Technology on Society	Z,ZK	3
32MC-K-RIZZ-01	Risk Behavior of Pupils	KZ	3

List of courses of this pass:

Code	Name of the course	Completion	Credits
01PTZ	Support for Talented Pupils	KZ	4

02UAOR	Astrophysics and General Relativity	ZK	3
The course provides a basic overview of concepts in astronomy, key topics in astrophysics, and selected topics from general relativity. It is designed as an introduction for future teachers who, after completing the course, will be better equipped to understand the subject matter and independently study further topics.			
02UDIF1	Physics Didactics 1	Z,ZK	6
The course provides an introduction to and practical training in methodological approaches to teaching physics in secondary schools. It covers diverse approaches to science education and to physics instruction specifically. Emphasis is placed on lesson preparation and delivery with a focus on engaging students. Students will practice both student-led and demonstration experiments, as well as laboratory work. The course highlights interesting and essential topics in mechanics, molecular physics, and oscillations and waves, tailored to the secondary school level.			
02UDIF2	Physics Didactics 2	Z,ZK	6
This course builds upon Physics Didactics I. It offers practical training in methodological procedures for teaching physics in secondary schools. The course introduces inquiry-based learning and laboratory work in physics. It emphasizes learning in context and the application of physics knowledge in practice. Student motivation and possibilities for formative assessment in physics education are addressed. The course focuses on engaging and essential topics in electricity and magnetism, optics, and modern physics at the secondary school level.			
02UDIP	Diploma Thesis	Z	12
Under expert supervision, students will prepare the practical part of their diploma thesis. At the end of the semester, they will present their work to fellow students and defend their approach.			
02UHF	History of Physics and Technology Applications	KZ	3
Students will become acquainted with key experiments and discoveries that have significantly contributed to the development of our current understanding of the natural world. This knowledge can be effectively incorporated into physics teaching as a supplement to the curriculum. Presenting interesting facts about experiments, prominent scientists, and their applications will enrich the instruction and enhance student motivation.			
02UICT	ICT in Natural Science Education	KZ	3
This course is designed for students in teacher education and introduces methods of working with ICT and their application in teaching mathematics, physics, chemistry, and natural sciences in general, taking into account the students specialization. In addition to familiarizing students with current ICT options, the course strengthens their competencies in digital technologies and communication.			
02UINT	Didactics of Integrated Science Education	KZ	6
This course explores cross-cutting topics from the perspective of natural sciences. While mathematics, physics, and chemistry are traditionally taught as separate subjects in schools, their content frequently overlaps and intersects. In such cases, collaboration among teachers across disciplines is beneficial. The course will present several topics suitable for building interdisciplinary relationships and fostering cooperation among teachers within a school. Students will be introduced to tandem teaching and project-based learning methods.			
02UPDP	Didactic-Pedagogical Project of the Diploma Thesis	Z	2
Students will become familiar with the principles of writing a masters thesis, conduct a literature review and research other relevant sources, and propose the structure and methodology of their work. They will also develop and present the theoretical didactic-pedagogical section of their thesis. These outcomes will be presented to peers and defended during the presentation.			
02UPPP	Introduction to Teaching Practice	Z	6
The course focuses on preparing students for lesson planning before they begin their teaching practice.			
02UPPS	Direct School-Based Teaching Practice	Z	15
Before beginning the teaching practice, the student completes an introductory course in teaching practice (Introduction to Teaching Practice). The first phase of direct practice primarily involves classroom observation at a specific school and the preparation of observation protocols. In the following phase, students actively participate in teaching and engage in school-related activities. The student carries out the practice at a designated school for one semester, either two days per week or one day per week over the course of the school year. At least 90 hours must be spent in the classroom, of which 45 hours involve actual teaching, either independently or in pairs. The full 15 ECTS credits also account for time spent on lesson preparation, writing observation protocols, and similar activities, amounting to a total of 450 hours.			
02UPSP	Practicum in School Physics Experiments	KZ	3
The aim of the course is to acquaint students with the fundamental types of experiments and their effective integration into secondary school physics instruction. The course also introduces the technical equipment of the physics laboratory and preparation room. Pre-service teachers will learn to prepare, appropriately incorporate into lessons, and clearly explain core experiments in mechanics, oscillations and waves, thermodynamics, electricity and magnetism, and optics. The Practicum in School Physics Experiments complements the theoretical foundations provided in Physics Didactics 1 and Physics Didactics 2.			
02URPP	Reclection on Teaching Practice	Z	3
This practically oriented course places special emphasis on collaboratively seeking effective solutions to common challenges in teaching practice, as well as on strategies for managing dynamic changes in contemporary education. The instruction is primarily based on creating a safe and supportive environment for reflecting on ones own learning dispositions, sharing and processing emotions and challenging professional topics, including the presentation and communication of students initial pedagogical outcomes. Methods incorporated include structured discussions, feedback interviews, and mentoring.			
02USTA	Current Trends in the Development and Application of Natural Sciences	Z	6
This course is designed for teacher education students. It introduces students to the latest research directions in the natural sciences. Emphasis is placed on developing professional qualifications and interdisciplinary connections. The course is delivered through specialized seminars, which also include guest lectures from external experts, and features a field trip to a specialized research facility.			
15AMV	Activating Teaching Methods	KZ	4
The student will become familiarboth theoretically and especially practicallywith activation methods used in science education, their significance, and their effective implementation in the teaching and learning process. Based on the instructional objective, the student selects an appropriate activation method and designs a segment of a lesson, including its reflection and evaluation.			
32MC-K-ODID-01	General Didactics	Z,ZK	5
32MC-K-OSPN-01	Personality: Pathology and Normality	KZ	3
32MC-K-PEDO-01	General Pedagogy	Z,ZK	5
The course focuses on basic knowledge of educational phenomena, processes, laws, principles, categories, and theories that form the basis of pedagogical thinking. Education and training will be discussed in the context of pedagogical sciences in connection with changes in the Czech education system over the past twenty years, namely in relation to curricular reform, diversification of the system, alternative educational concepts, and changes in vocational education.			
32MC-K-PEDS-01	Social Pedagogy	ZK	3
32MC-K-PSEP-01	Psychology in Educational Process	Z,ZK	5
The course guides students toward future applications of psychological theory in practical teaching activities. It facilitates the acquisition and development of specific skills, particularly in the area of personal development and understanding the personality traits of others. Furthermore, the course presents selected psychological knowledge necessary for understanding and guiding the educational process. This mainly concerns the characteristics and development of cognitive, motivational, and emotional processes, the psychological characteristics of individuals, and their changes in individual developmental stages, especially during adolescence.			
32MC-K-PSHY-01	Psycho-hygiene Aspects of Teaching Profession	Z,ZK	3

32MC-K-RIZZ-01	Risk Behavior of Pupils	KZ	3
32MC-K-SKMN-01	School Management	ZK	3
32MC-K-SPKO-01	Social and Pedagogical Communication	KZ	3
32MC-K-SVZP-02	Education of Pupils with Special Educational Needs in Science Subjects	ZK	4
32MC-K-TECR-01	Impacts of Information Technology on Society	Z,ZK	3
32ME-K-PRSK-01	Presentation and Communication Skills	ZK	4

For updated information see http://bilakniha.cvut.cz/en/FF.html
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