



University of Hradec Králové  
Faculty of Science

# COURSE CATALOGUE



University of Hradec Králové  
Faculty of Science

The Faculty of Science is the youngest faculty at University of Hradec Králové (FoS UHK) established in 2010. It has over 600 students of biology, chemistry, informatics, mathematics, physics, toxicology and science teaching programs. The faculty is on the rise now more than ever before, residing on the new modern university campus.

The faculty consists of **5 departments**:

- Department of Applied Cybernetics
- Department of Biology
- Department of Chemistry
- Department of Mathematics
- Department of Physics

We offer studies at all levels: Bachelor, Master and Doctoral (Ph.D.) degrees.

## INTERNATIONAL STUDENTS

International students can choose their courses taught in English from this Course catalogue as well as from courses offered by other faculties of UHK, but their study program should involve at least 75% of courses provided by the Faculty of Science. When seeking for scholarship, students can take advantage of choosing from various international programs including our vast range of Erasmus+ partners program and other types of cooperation.

## MODERN FACILITIES

The Faculty resides on a modern campus that includes teaching and research facilities, lecture halls, laboratories, student lounges, a library, buffets and locker rooms. The campus is situated within walking distance of the city centre and other university buildings.

Modern university in the heart of Europe



## ACCOMMODATION

All international students are provided with accommodation at the university dormitory. The accommodation costs approx. €120/month.

## ABOUT THE UNIVERSITY OF HRADEC KRÁLOVÉ

The University of Hradec Králove is a public university (est. in 1959) and provides high-quality education to almost 7,000 students. The UHK consists of 4 faculties: Faculty of Education, Faculty of Informatics and Management, Philosophical Faculty and Faculty of Science. There are several student organizations functioning at the UHK, including ESN Buddy System.



## THE CITY OF HRADEC KRÁLOVÉ

Hradec Kralove is located 100 km east from capital city, Prague. Hradec Kralove with its 100,000 inhabitants is famous for many parks and green areas, a remarkable scenery at the confluence of the Labe and Orlice rivers, historical and urban centre as well as its social and cultural life.



## CONTACTS

For further information contact our International Office.

Please note that the course offer may change.

## INTERNATIONAL OFFICE

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<https://www.uhk.cz/en/faculty-of-science/about-faculty>

[www.uhk.cz](http://www.uhk.cz)



**Bachelor programs**

## BIOLOGY

Course title	Abbreviation*	Type**	Semester	ECTS credits
Animal Anatomy and Morphology	KBI/BAMZI	L	W	3
Basic Ethology	KBI/BZAET	L	W	3
Basic Toxicology and Ecotoxicology	KBI/BZTOE	L+P	W	4
Biogeography	KBI/BBIOG	L	W	3
Cell Biology	KBI/BZABB	L+P	W	5
Dendrology	KBI/BDEND	S	W	3
Evolutionary Biology	KBI/BEVBI	L	W	3
Geology	KBI/BZAGE	L+P	W	4
General Ecology	KBI/BOBEK	L+P	W	4
Human Anatomy	KBI/BANCL	L+P	W	4
Microbiology	KBI/BMIBI	L+P	W	4
Molecular Biology	KBI/BMOBI	L	W	3
Phylogeny of Algae and Fungi	KBI/BFSSO	L+P	W	5
Phylogeny of Vascular Plants	KBI/BFSVR	L+P	W	5
Phylogeny of Vertebrates	KBI/BFSST	L+P	W	5
Plant Physiology	KBI/BFYRO	L+P	W	5
Principles of Geoinformatics	KBI/BUVGE	L+S	W	4
Principles of Terraristics	KBI/BZTER	S	W	3

<b>Course title</b>	<b>Abbreviation*</b>	<b>Type**</b>	<b>Semester</b>	<b>ECTS credits</b>
Animal Ecology	KBI/BEKZI	L+P	S	4
Biophysics	KBI/BBIOF	L+P	S	3
Comparative Animal Physiology	KBI/BSRFZ	L+P	S	5
Conservation of Nature and Landscape 1	KBI/BOPK1	S	S	3
Genetics	KBI/BGENE	L+P	S	4
Ecology of Cyanobacteria and Algae	KBI/BEKSR	S+P	S	3
Field Excursions of Botany	KBI/BBOTC	P	S	3
Field Excursions of Geology	KBI/BGETC	P	S	2
Field Excursions of Zoology	KBI/BZCVT	P	S	3
Hydrobiology	KBI/BHYDR	L+P	S	4
Phylogeny of Invertebrates	KBI/BFSBE	L+P	S	5
Physical Geography	KBI/BFYGE	L+P	S	4
Plant Anatomy and Morphology	KBI/BAMRO	L+P	S	5
Plant Ecology	KBI/BEKRO	L+P	S	5

\*\* Lecture (L), Seminar (S), Practice (P), Laboratory Practice (LP)

# CHEMISTRY

Course title	Abbreviation*	Type**	Semester	ECTS credits
Analytical Chemistry 1	KCH/BANA1	L+S	W	4
Bachelor Thesis 1 in Chemistry	KCH/BBAP1	LP	W	6
Chemical databases	KCH/BCHDA	P	W	2
General and Inorganic Chemistry 1	KCH/BOAN1	L+S	W	4
Fundamentals in Medicinal Chemistry	KCH/BFACH	L	W	4
Fundamentals in Molecular Modelling	KCH/ BMOMO	L	W	2
Fundamentals in Toxicology and Pharmacology	KCH/BTOFA	L	W	2
History of Chemistry	KCH/BHICH	L	W	2
Laboratory Practice in Analytical Chemistry 1	KCH/BLAN1	LP	W	3
Laboratory Practice in Instrumental Methods	KCH/BLINS	LP	W	2
Laboratory Practice in Organic Chemistry 2	KCH/BLOR2	LP	W	3
Laboratory Practice in Physical Chemistry	KCH/BLFCH	LP	W	2
Laboratory Practice in Structural Study of Organic Compounds	KCH/BLSOS	LP	W	2
Laboratory Technique	KCH/BLABT	LP	W	3
Methods for Structural Study of Organic Compounds	KCH/BMSOS	S	W	2
Occupational Safety in Chemistry	KCH/BBEPR	L	W	2
Organic Chemistry 2	KCH/BORG2	L+S	W	6
Physical Chemistry	KCH/BFYCH	L+S	W	3

<b>Course title</b>	<b>Abbreviation*</b>	<b>Type**</b>	<b>Semester</b>	<b>ECTS credits</b>
Practice in Fundamentals of Molecular Modelling	KCH/BCMOM	P	W	2
Technology and Environmental Protection	KCH/BTOZP	L	W	3
Toxicology and Analysis of Food	KCH/BTOAP	L	W	2
Toxicology of Inorganic and Organic Compounds	KCH/BTAOS	L	W	3
Analytical Chemistry 2	KCH/BANA2	L+S	S	4
Bachelor Thesis 2 in Chemistry	KCH/BBAP2	LP	S	12
Biochemistry	KCH/BBICH	L	S	4
Bioorganic Chemistry	KCH/BBIOR	L	S	4
Chemical and Biological Terrorism	KCH/BCHBT	L	S	2
Chemical Software	KCH/BCHSO	S	S	2
General and Inorganic Chemistry 2	KCH/BOAN2	L	S	4
Laboratory Practice in Analytical Chemistry 2	KCH/BLAN2	LP	S	3
Laboratory Practice in Biochemistry	KCH/BLBCH	LP	S	2
Laboratory Practice in Bioorganic Chemistry	KCH/BLBIO	LP	S	3
Laboratory Practice in Inorganic Chemistry	KCH/BLANC	LP	S	2
Laboratory Practice in Organic Chemistry 1	KCH/BLOR1	LP	S	3
Laboratory Practice in Separations Methods	KCH/BLSEM	LP	S	2
Organic Chemistry 1	KCH/BORG1	L+S	S	3
Reaction Mechanisms in Organic Chemistry	KCH/BREME	L+S	S	3



Course title	Abbreviation*	Type**	Semester	ECTS credits
Toxicology of Plant and Animal Toxins	KCH/BTRZJ	L	S	3

\*\* Lecture (L), Seminar (S), Practice (P), Laboratory Practice (LP)

## INFORMATICS

Course title	Abbreviation*	Type**	Semester	ECTS credits
3D Print	KKY/NV3DT	L+P	W	3
Algorithms and Data Structures	KKY/BALGD	L+P	W	4
Computer Graphics	KKY/BPOGR	L+P	W	3
Cyber Security	KKY/BKYBE	L+P	W	3
Database Systems	KKY/BDASY	L+P	W	3
Discrete Methods and Optimization	KKY/NDIMO	L+P	W	4
Mobile Applications Development	KKY/NVYMA	L+P	W	3
Multimedia and Int. Devices in Teaching	KKY/NMMIZ	P	W	2
Multimedia Systems	KKY/BMUSY	L+P	W	3
Programming, Computers 1	KFY/BPP1	L+P	W	4
Programming, Computers 3	KFY/BPP3	L+P	W	4
Programming of Robot Kits	KKY/NPRRS	P	W	2
Structured Programming	KKY/BSTPR	L+P	W	3
Web Application Programming	KKY/NPRWA	L+P	W	3

<b>Course title</b>	<b>Abbreviation*</b>	<b>Type**</b>	<b>Semester</b>	<b>ECTS credits</b>
Advanced Procedures in MS Office	KCH/BPFOF	S	S	2
Computer Architecture 1	KKY/BARP1	L+P	S	4
Desktop Publishing	KKY/NVDTP	L+P	S	3
Development of Dynamic Website	KCH/BDYWE	P	S	2
Fundamentals in Algorithmizing and Programming	KCH/BALPR	L+P	S	3
History of Computing Technology	KKY/NDEVT	L+P	S	4
Modeling and Simulation	KKY/NMOSI	L+P	S	4
Object-oriented Programming	KKY/BOOPR	L+P	S	4
Programmable Electronics	KKY/NPREL	L+P	S	3
Programming, Computers 2	KFY/BPP2	L+P	S	3
Programming, Computers 4	KFY/BPP4	L+P	S	5
Programming and Education	KKY/BPRUC	L+P	S	4
Python Programming Language	KKY/NPJPY	L+P	S	4
Web Technology	KKY/BWEDA	L+P	S	3

\*\* Lecture (L), Seminar (S), Practice (P), Laboratory Practice (LP)

# MATHEMATICS

Course title	Abbreviation*	Type**	Semester	ECTS credits
Algebra 1	KMA/BALG1	L+S	W	6
Fundamentals of Numerical Mathematics	KMA/BZNUM	L+S	W	3
Geometry 1	KMA/BGEO1	L+S	W	4
Geometry 3	KMA/BGEO3	L+S	W	3
Introduction to Mathematics	KMA/BUSTM	S	W	2
Introduction to Topology	KMA/BZTOP	L+S	W	2
Mathematical Analysis 1	KMA/BANL1	L+S	W	5
Mathematical Analysis 3	KMA/BANL3	L+S	W	3
Mathematical Software	KMA/BMASW	S	W	1
Algebra 2	KMA/BALG2	L+S	S	5
Algebra 3	KMA/BALG3	L+S	S	4
Discrete Mathematics	KMA/BZAKO	L+S	S	2
Fundamentals of Probability and Statistics	KMA/BKKPS	S	S	2
Geometry 2	KMA/BGEO2	L+S	S	4
Geometry 4	KMA/BGEO4	L+S	S	3
Introduction to Didactics of Mathematics	KMA/BUDIM	S	S	4
Mathematical Analysis 2	KMA/BANL2	L+S	S	4
Typography of Mathematics Texts	KMA/BSTEX	S	S	2

\*\* Lecture (L), Seminar (S), Practice (P), Laboratory Practice (LP)

## PHYSICS

Course title	Abbreviation*	Type**	Semester	ECTS credits
Automation and Measurement	KFY/BAM	L+S	W	3
Basics of Measuring Instruments	KFY/BZMER	LP	W	2
General Physics – Mechanics	KFY/BZFM	L+S	W	5
History of Physical Measurements	KFY/BHM	LP	W	3
Instrumental Techniques 2	KFY/BPTE2	L	W	3
Measurement of Physical Quantities	KFY/BMFV	S	W	3
Physical Laboratory 2	KFY/BFP2	P	W	4
Physical Laboratory 4	KFY/BFP4	P	W	3
Practical Instrumental Techniques 2	KFY/BPPT2	LP	W	2
Principles of Electronics	KFY/BZE	L+S	W	4
Principles of Physics – Electricity 2	KFY/BZFE2	L+S	W	6
Principles of Physics – Particles and Fields	KFY/BZFCP	L+S	W	4
Systems of CAD 2	KFY/BSC2	S	W	2
Bachelor Thesis in Physics	KFY/BKP	P	S	15
Fundamentals of Physics – Oscillations and Waves	KFY/BZFKV	L+S	S	5
General Physics – Heat	KFY/BZFT	L+S	S	4
Instrumental Techniques 1	KFY/BPTE1	L+S	S	4
Instrumental Techniques 3	KFY/BPTE3	L	S	2

<b>Course title</b>	<b>Abbreviation*</b>	<b>Type**</b>	<b>Semester</b>	<b>ECTS credits</b>
Physical Laboratory 1	KFY/BFP1	S	S	3
Physical Laboratory 3	KFY/BFP3	P	S	4
Physical Laboratory 5	KFY/BFP5	P	S	3
Practical Instrumental Techniques 3	KFY/BPPT3	P	S	1
Principles of Physics – Electricity 1	KFY/BZFE1	L+S	S	3
Systems of CAD 1	KFY/BSC1	S	S	3

\*\* Lecture (L), Seminar (S), Practice (P), Laboratory Practice (LP)



**Master programs**

## BIOLOGY

Course title	Abbreviation*	Type**	Semester	ECTS credits
Animal Ecophysiology	KBI/NEKFZ	L+P	W	6
Biological Monitoring	KBI/NBIOM	L	W	4
Bryology and Lichenology	KBI/NBRLI	S	W	3
Conservation of Nature and Landscape 2	KBI/NOPK2	L+P	W	5
Developmental Biology	KBI/NDEBI	S	W	3
Ecotoxicology	KBI/NEKTO	L+P	W	4
Entomology	KBI/NENTO	L+P	W	6
Landscape Ecology	KBI/NEKKR	L+P	W	5
Mammaliology	KBI/NMAMA	L	W	3
Methods of Molecular Biology	KBI/NMEMB	P	W	3
Mycology	KBI/NMYKO	S	W	3
Nanotechnology	KBI/NNANO	S	W	3
Ornithology	KBI/NORNI	L	W	3
Parasitology	KBI/NPARA	L	W	3
Physiology of Plant Nutrition	KBI/NFVYR	L+P	W	4
Special Field Practice of Botany	KBI/NSBTC	P	W	3
Special Microbiology	KBI/NSPMI	L+P	W	6
Vegetation of Selected Ecosystems of Europe	KBI/NVVEE	L+P	W	6

<b>Course title</b>	<b>Abbreviation*</b>	<b>Type**</b>	<b>Semester</b>	<b>ECTS credits</b>
Water and Wetland Plants	KBI/NVMRO	P	W	4
Biology of Ants	KBI/NBIMR	S	S	3
Biology of Freshwater Invertebrates	KBI/NBIVB	S	S	3
Biology of Terrestrial Invertebrates	KBI/NBITB	S	S	3
Biotopes of the Czech Republic	KBI/NBICR	L+P	S	6
Czech Vertebrates	KBI/NOBCR	L+S	S	6
Ethology	KBI/NETOL	S	S	3
Food Safety	KBI/NBEPO	S	S	3
Forest Ecology	KBI/NEKLE	L+P	S	4
Genomics and Proteomics	KBI/NGEPR	L+P	S	5
GMO	KBI/NGEMO	S	S	4
Malacology	KBI/NMALA	S	S	3
Natural Toxins	KBI/NPRTO	L	S	3
Phytogeography	KBI/NFYGE	S	S	4
Plant Ecophysiology	KBI/NEKFR	L+P	S	6
Practices from Animal Morphology	KBI/NCVMZ	P	S	3
Restoration Ecology	KBI/NEKOB	L	S	5
Zoological Methods	KBI/NMEZP	P	S	3

\*\* Lecture (L), Seminar (S), Practice (P), Laboratory Practice (LP)



# CHEMISTRY

Course title	Abbreviation*	Type**	Semester	ECTS credits
Advanced Biochemical Methods	KCH/NPBCH	L	W	3
Advanced Inorganic Chemistry	KCH/NPANC	L	W	3
Advanced Medicinal Chemistry	KCH/NPFAC	L	W	4
Advanced Molecular Biology	KCH/NPMOB	L	W	3
Advanced Molecular Modelling	KCH/NPMOM	L	W	3
Advanced Organic Chemistry	KCH/NPORG	L+S	W	4
Applied Toxicology and Ecotoxicology	KCH/NAPTE	L	W	3
Diploma Thesis 1 in Chemistry	KCH/NDIP1	LP	W	3
Diploma Thesis 3 in Chemistry	KCH/NDIP3	LP	W	5
Electromigration Methods	KCH/NELME	L	W	2
Heterocyclic Chemistry	KCH/NCHHE	L	W	2
Laboratory Practice in Advanced Biochemical Methods	KCH/NLBCH	LP	W	2
Laboratory Practice in Advanced Molecular Modelling	KCH/ NCMOM	P	W	2
Laboratory Practice in Advanced Molecular Biology	KCH/NLMOB	LP	W	2
Laboratory Practice in Advanced Organic Chemistry	KCH/NLORG	LP	W	2
Laboratory Practice in NMR	KCH/NLNMR	LP	W	2

<b>Course title</b>	<b>Abbreviation*</b>	<b>Type**</b>	<b>Semester</b>	<b>ECTS credits</b>
Laboratory Practice in Preparation of Synthetic Drugs	KCH/NLPSY	LP	W	2
Laboratory Practice in Sampling and Sample Preparation	KCH/NLOPV	LP	W	2
Mass Spectroscopy	KCH/NHMSP	L	W	3
Military and Agrochemical Toxicology	KCH/NTOVA	L	W	2
Pathobiochemistry	KCH/NPATB	L	W	2
Preparation of Synthetic Drugs	KCH/NPSYL	L	W	3
QSAR	KCH/NQSAR	L	W	2
Sampling and Sample Preparation	KCH/NOPVZ	L	W	2
Toxicology of Nanoparticles	KCH/NTONA	L	W	2
Toxicology of Natural and Bioactive Compounds	KCH/NTPBS	L	W	3
Advanced Bioorganic Chemistry	KCH/NPBIO	L	S	4
Analysis of Biological Samples	KCH/NABIV	L	S	2
Bioinorganic chemistry	KCH/NBIAN	L	S	3
Chromatographic Methods	KCH/NCHRM	L	S	3
Diploma Thesis 2 in Chemistry	KCH/NDIP2	LP	S	5
Diploma Thesis 4 in Chemistry	KCH/NDIP4	LP	S	10
Ecotoxicological Bioassays	KCH/NEKOT	LP	S	2

<b>Course title</b>	<b>Abbreviation*</b>	<b>Type**</b>	<b>Semester</b>	<b>ECTS credits</b>
Laboratory Practice in Advanced Bioorganic Chemistry	KCH/NLBIO	LP	S	2
Laboratory Practice in Chromatographic Methods	KCH/NLCHR	LP	S	2
Laboratory Practice in Molecular and Atomic Spectrometry	KCH/NLMAS	LP	S	2
Molecular and Atomic Spectrometry	KCH/NMASP	L	S	3
Stereochemistry	KCH/NSTER	L	S	3

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# MATHEMATICS

Course title	Abbreviation*	Type**	Semester	ECTS credits
Applied Statistics	KMA/NASTA	L+S	W	3
Didactics of Mathematics 1	KMA/NDMA1	L+S	W	2
Didactics of Mathematics 3	KMA/NDMA3	L+S	W	4
Financial Mathematics	KMA/NFINM	L+S	W	2
Fundamentals of Difference Equations	KMA/NDIFR	L	W	2
Fundamentals of Probability	KMA/NPRAV	L+S	W	2
Graph Theory	KMA/NTEOG	L+S	W	3
History of Mathematics	KMA/NDEJM	L	W	2
Introduction to Algebraic Topology	KMA/NUATO	L	W	2
Introduction to Theory of Differential Equations	KMA/NUTDR	L+S	W	5
Mathematical Analysis-Selected Chapters	KMA/NVKAN	L	W	2
Matrix Algebra	KMA/NMATA	L	W	2
Didactics of Mathematics 2	KMA/NDMA2	L+S	S	2
Educational Software	KMA/NDISW	S	S	2
Introduction to Algebraic Geometry	KMA/NUAGE	L	S	2
Introduction to Generating Functions	KMA/NVYTF	L	S	2
Introduction to Measure Theory	KMA/NTEOM	L	S	2
Introduction to Theory of Functions of Complex Variable	KMA/NUTKF	L	S	2

Course title	Abbreviation*	Type**	Semester	ECTS credits
Introduction to Theory of Metric Spaces	KMA/NUMPR	L	S	2
Methods of Solving Mathematical Problems 2	KMA/NMER2	S	S	2
Selected Topics in Algebra	KMA/NUTEC	L	S	2
Set Theory	KMA/NTMNO	L	S	2
Solid Geometry Modelling	KMA/NTMOD	S	S	2

\*\* Lecture (L), Seminar (S), Practice (P), Laboratory Practice (LP)

## PHYSICS

Course title	Abbreviation*	Type**	Semester	ECTS credits
Astrophysics and Geophysics	KFY/NASTR	L	W	3
Biophysics and Systems of Imaging in Biomedicine 1	KFY/NBZS1	P	W	2
Condensed Matter Physics 1	KFY/NFPK	L+S	W	5
Experiments in Modern Physics	KFY/NEMF	P	W	3
Fundamental Experiments and Historical Measurements	KFY/NFEHM	L+S	W	3
Laboratory Measurements and Modelling 1	KFY/NLMM1	LP	W	3
Modelling and Simulation 1	KFY/NMS1	P	W	4
Modelling and Simulation 3	KFY/NMS3	P	W	2
Physical Principles of Technology 1	KFY/NFZT	L+S	W	3

<b>Course title</b>	<b>Abbreviation*</b>	<b>Type**</b>	<b>Semester</b>	<b>ECTS credits</b>
Theoretical Mechanics 1	KFY/NTM	L+S	W	6
Theory of Relativity	KFY/NTR	L	W	3
Biophysics and Imaging Systems in Biomedicine 2	KFY/NBZS2	P	S	2
Diploma Thesis in Physics	KFY/NDP	P	S	15
Laboratory Measurements and Modelling 2	KFY/NLMM2	LP	S	3
Modelling and Simulation 2	KFY/NMS2	P	S	3
Quantum Physics	KFY/NKF	L+S	S	5
Theory of Electromagnetic Field	KFY/NTEP	L+S	S	4

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See you soon in  
**Hradec Králové!**







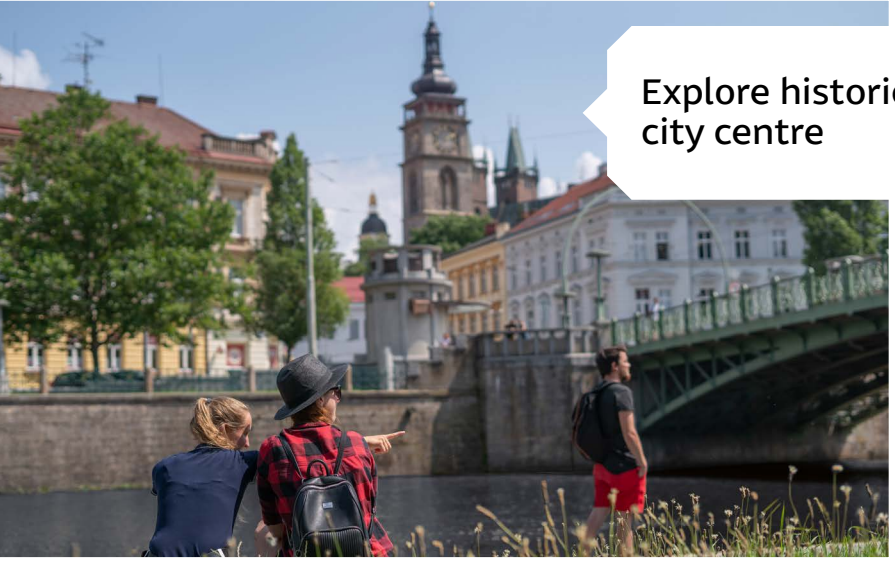
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