Course descriptions

TABLE OF CONTENTS

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-025/20	An Introduction to Extrasolar Planets and Brown Dwarfs

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 1.

Educational level: III.

Prerequisites:

Course requirements:
60/40
Scale of assessment (preliminary/final): 60/40

Learning outcomes:
Student will obtain basic knowledge required for further study and work in the field. Particular attention is given to understanding of the terms, methods and processes that take place in exoplanets and brown dwarfs. Course offers overview of the field with the latest highlights and discoveries.

Class syllabus:
Basic terms, definitions, and processes. Planet detection methods. Cosmic missions. Exoplanet properties and observations. Special and famous exoplanets. Interior (convection, degeneracy, equations of the structure). Formation and evolution, radii. Atmospheres (irradiation, stratospheres, heat redistribution, chemistry and composition, dust…). Brown dwarfs (definitions, observations, properties, spectral classification MLTY, formation, disks, interior, evolution, atmospheres).

Recommended literature:
-Recent articles in the field
-Heng, K. 2017, Exoplanetary Atmospheres, Princeton Univ. Press, ISBN: 978-0-691-16698-8
-Perryman, M. 2018, The exoplanet handbook 2nd Edition (Cabridge Univ. Press) ISBN:9781108419772, 63 pounds
-Cassen, P., Guillot, T., Quirrenbach, A., 2006, Extrasolar Planets: Saas Fee Advanced Course 31 (Swiss Society for Astrophysics and Astronomy
450p, Hardcover, for grad students and researchers) ISBN: 978-3-540-29216-6, 75 Euro
-Seager, S. 2010, Exoplanets (University of Arizona Press, hardcover, 526p)
-B.W. Carroll, D.A. Ostlie, 1996, 2006, Introduction to modern astrophysics,1, 2.nd issue
-N.I. Reid, S.L. Hawley, 2005, New light on dark stars: red dwarfs, low mas stars, brown dwarfs (560p, Springer, 2.nd issue)
ISBN-10: 3540251243, ISBN-13: 978-3540251248.

Languages necessary to complete the course:
English

Notes:
Spoken language of the presentation is English

Past grade distribution
Total number of evaluated students: 1

ABS	NEABS
100,0	0,0

Lecturers: RNDr. Ján Budaj, CSc.

Last change: 24.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-016/11	Analytical Methods for Study of Solid Body Surfaces

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 4.

Educational level: III.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers: prof. RNDr. Andrej Plecenik, DrSc.

Last change: 02.06.2015

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-005/00	Analytical and Numerical Methods in Celestial Mechanics

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 1.

Educational level: III.

Prerequisites:

Course requirements:
Continuous assessment: individual work
Exam
Scale of assessment (preliminary/final): 30/70

Learning outcomes:

Class syllabus:
Motivation – Newton's equation of motion and orbital elements in celestial mechanics. Gravitational attraction between bodies of finite dimensions. Perturbation equations of celestial mechanics – derivation from Newton's equation of motion. Simple application to motion of the Moon. Nongravitational effects. The effect of electromagnetic radiation on motion of particles: types of osculating orbital elements, detail analytical calculation of orbital evolution up to the second order of perturbation theory, secular evolution of orbital elements, orbital resonances with planets. Influence of the solar (stellar) wind. Oort's cloud of comets and gravitational perturbations of the Galaxy – secular evolution of cometary orbits. Comparison between analytical and numerical solutions.

Recommended literature:
Brouwer D., Clemence G. M.: 1961, Methods of Celestial Mechanics, Academic Press, New York.
Murray C. D., Dermott S. F.: 1999, Solar System Dynamics, Cambridge Univ. Press
Hockney R. W., Eastwood J. W.: 1992, Computer Simulation Using Particles, J. W. Arrowsmith Ltd, Bristol
Press W. H., Flannery B. P., Teukolsky S. A., Vetterling W. T.: Numerical Recipes, Cambridge Univ. Press

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 1

ABS	NEABS
100,0	0,0

Lecturers: doc. RNDr. Jozef Klačka, PhD.

Last change: 21.06.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-021/13	Astronomical Observations (1)

Educational activities:
Type of activities: fieldwork
Number of hours:
per week: 4 **per level/semester:** 52
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 1.

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Planning of observation (object selection, exposure estimation, etc.). Obtaining calibration images and raw images with the object. Reduction process of observations. Working with achieved observations.

Class syllabus:
Photometric material/data is the most important and relatively readily available source of information about small bodies in the Solar System. By proper planning of observations and processing, it is possible to extract comprehensive information on some of the physical properties of asteroids and comets. Using various programs and methods, we are able to determine the rotation rate/period, the change in brightness over a wider time interval of observations, or over a wider interval of phase angles, and we can estimate the approximate size and shape of the body, and possibly the surface composition as well. Sharing our observations with other observers, we can pick out some interesting phases (specific time during nights) in a relatively short time for more efficient planning of future observations.

Recommended literature:
1. Budding E., Demircan O.: Introduction to Astronomical Photometry (Second Edition). Cambridge University Press, New York, 2007
2. Howell S. B.: Handbook of CCD Astronomy (Second Edition). Cambridge University Press, New York, 2006
3. Roth G. D.: Handbook of Practical Astronomy, Springer-Verlag, Heidelberg, 2009
4. Warner B. D.: A Practical Guide to Lightcurve Photometry and Analysis, Springer, New York, 2006
5. URL: http://www.minorplanetcenter.net/
6. URL: http://ssd.jpl.nasa.gov/?horizons
7. some selected chapter from book Asteroids III and IV

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers: Mgr. Marek Husárik, PhD.

Last change: 24.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-022/13	Astronomical Observations (2)

Educational activities:
Type of activities: fieldwork
Number of hours:
per week: 4 **per level/semester:** 52
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 2.

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Planning of observation (object selection, exposure estimation, etc.). Obtaining calibration images and raw images with the object. Reduction process of observations. Working with achieved observations.

Class syllabus:
Photometric material/data is the most important and relatively readily available source of information about small bodies in the Solar System. By proper planning of observations and processing, it is possible to extract comprehensive information on some of the physical properties of asteroids and comets. Using various programs and methods, we are able to determine the rotation rate/period, the change in brightness over a wider time interval of observations, or over a wider interval of phase angles, and we can estimate the approximate size and shape of the body, and possibly the surface composition as well. Sharing our observations with other observers, we can pick out some interesting phases (specific time during nights) in a relatively short time for more efficient planning of future observations.

Recommended literature:
1. Budding E., Demircan O.: Introduction to Astronomical Photometry (Second Edition). Cambridge University Press, New York, 2007
2. Howell S. B.: Handbook of CCD Astronomy (Second Edition). Cambridge University Press, New York, 2006
3. Roth G. D.: Handbook of Practical Astronomy, Springer-Verlag, Heidelberg, 2009
4. Warner B. D.: A Practical Guide to Lightcurve Photometry and Analysis, Springer, New York, 2006
5. URL: http://www.minorplanetcenter.net/
6. URL: http://ssd.jpl.nasa.gov/?horizons
7. some selected chapter from book Asteroids III and IV

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers: Mgr. Marek Husárik, PhD.

Last change: 24.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-023/13	Astronomical Observations (3)

Educational activities:
Type of activities: fieldwork
Number of hours:
per week: 4 **per level/semester:** 52
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 3.

Educational level: III.

Prerequisites:

Course requirements:
100/0
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
A broadening of theoretical knowledge and obtaining basic practical skills for preparation and performance of the spectropolarimetric observations of the Sun focusing on coronagraphic observations of the emission lines of prominences and corona at the high-altitude observatory and on data reduction of these observations.

Class syllabus:
History, actual status, scientific profile ans instrumental equipment of the Lomnický štít observatory of AI SAS. The Lyot-type coronagraph, the Lyot-Ohman interference-polarization filter, CMOS detectors: principles of instruments and practical tests of performance. Emission corona of the Sun: history of research, actual possibilities of the ground=based observations. Practical examples of preparation and performance of coronagraphic observations of the emission lines of prominences and solar corona. Practice with data reduction of spectropolarimetric observations of the emission lines.

Recommended literature:
• Observational Astrophysics, by Lena, P., Lebrun, F., Mignard, F., Edition: 2, Publisher: Berlin, Heidelberg, New York Springer-Verlag 1998
• Slnečná koróna, by Rusin, V. a Rybansky, M. Edition: 1, Publisher: Bratislava VEDA 1990
• Introduction to Spectropolarimetry, by del Toro Iniesta, J. C. Editions: 1,2, Publisher: Cambridge Cambridge University Press 2003, 2007

Languages necessary to complete the course:
Slovak / English

Notes:

course requires: good helth status, a short-term stat at the Lomnický štít Obseervatory SAV, basics of the operating system linux and the comutational environment IDL

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers: RNDr. Ján Rybák, CSc.

Last change: 22.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-024/13	Astronomical Observations (4)

Educational activities:
Type of activities: fieldwork
Number of hours:
per week: 4 **per level/semester:** 52
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 5.

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Obtaining practical knowledge in photometric and spectroscopis observation in stellar astronomy as well is in the data reduction.

Class syllabus:
The most important observational techniques of the stellar astronomy are photometry and spectroscopy. Stellar photometry is an exact measurement of brightness of stars. The goal of the photometry is either to study the variability of the object (e.g. eclipsing binaries, novae, pulsating variables) or to estimate its temperature using colour filters. Brightness of the stellar object is usually determined with respect to one or several stars with presumably stable brightness and close to the object on the sky (differential photometry). Light from the objects and sky background is confined to digital diaphragms on the CCD frame (apertures). Stellar brightness is usually determined in various systems of filters which enhance the information we obtain. Narrow-band filter sets are designed not only to determine the temperature but also to estimate metalicity and luminosity. Important effect to be taken into account is the atmospheric extinction which cannot be neglected in wider fields or if the colour of stars significantly differs. The apparent brightness and colour of stars is affected by an interstellar reddening. Magnitudes from a particular instrument are usually transformed to the international photometric system. This is done by observations of standard stars in open clusters over a large airmass range.
In stellar spectroscopy we obtain the spectrum of the object, which is the wavelength dependence of its brightness (flux). Image of the object produced by a telescope is precisely guided on the aperture of the spectrograph (slit, optical fiber). A spectrograph is an instrument which disperses the light of the object and produces its spectrum. Its principal parts are an entrance slit, a collimator, a dispersion element (prism, diffraction grating), a camera (imaging lens) and a detector (CCD chip). To extract the stellar spectra from the CCD frames we need to perfectly define the position of the spectra on the frames and to determine transformation between the pixel coordinates and wavelength. This is done by obtaining spectra of calibration lamps (line and continuous spectra). Stellar spectra enable

us to get information on the temperature, metallicity, luminosity, abundance of elements, rotation or radial velocity of the object.
Quality of the light curves (photometry) and spectra significantly depends on the proper data reduction. Introduction to the data reduction under the IRAF environment will be part of the course. The observations within this course will be obtained at 60cm and 1.3m telsecopes of the Astronomical institute of SAS.

Recommended literature:
Stewe Howell, Handbook of CCD astronomy, Cambridge University Press, 2012 (ISBN 9780511807909)
Immo Appenzeller, Introduction to Astronomical Spectroscopy, Cambridge University Press, 2012 (ISBN 9781139059503)

Languages necessary to complete the course:
English

Notes:

Past grade distribution
Total number of evaluated students: 1

ABS	NEABS
100,0	0,0

Lecturers: RNDr. Theodor Pribulla, CSc.

Last change: 07.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-803/10	BSc Thesis Supervision

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 10

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Supervision Bachelor work
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The student will gain experience in leading the preparation of the final thesis.

Class syllabus:
Proposal of the topic of the final thesis. Consultations provided to the student. Preparation of work report.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 2

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-019/13	CCD Methods in Astronomy

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 4.

Educational level: III.

Prerequisites:

Course requirements:
50/50
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
Obtaining a more detailed information on basic detectors used in astronomical observations.

Class syllabus:
CCD, CMOS and SPAD detectors enable us to detect electromagnetic radiation of cosmic objects in a wide wavelength range from the UV to the IR region. These detectors have high quantum efficiency and linearity compared to a photographic plate or to a photomultiplier. They are the principal component of photometric and spectroscopic instruments. Properties and quality of the frames depends on several factors including the read-out noise, the gain, the pixel capacity, the bit depth of the analog-to-digital converter but also the detector temperature. These detectors are produced as arrays up to 10k x 10k nowadays. For larger telescopes where the size of the usable focal plane is also larger it is possible to produce mosaics of chips.

Recommended literature:
Stewe Howell, Handbook of CCD astronomy, Cambridge University Press, 2012 (ISBN 9780511807909)
James W. Beletic, Optical and Infrared Detector for Astronomy, in Foy R. & Foy F. (eds) Optics in Astrophysics pp 123-154, NATO Science Series II: Mathematics, Physics and Chemistry, vol. 198, Springer (ISBN 9781402034350)
selected up-to-date articles

Languages necessary to complete the course:
Slovak / English

Notes:
Languages necessary to complete the course: English

Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers: RNDr. Theodor Pribulla, CSc.	
Last change: 24.01.2022	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-501/10	Completion of PhD Research Project Stage

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 10

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Getting relevant results
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Report on the completion of the research phase.

Class syllabus:
Presentation of the results of professional and scientific work of the doctoral student within the project in the form of a report.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 1

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 19.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/3-MXX-101/15	Course of English for PhD Studies (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning, distance learning

Number of credits: 5

Recommended semester: 1.

Educational level: III.

Prerequisites:

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 166

A	ABS	B	C	D	E	FX	NEABS
50,6	43,98	0,6	0,0	0,0	2,41	0,0	2,41

Lecturers: PhDr. Alena Zemanová

Last change: 20.06.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJP/3-MXX-102/15	Course of English for PhD Studies (1)

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning, distance learning

Number of credits: 5

Recommended semester: 2.

Educational level: III.

Prerequisites: FMFI.KJP/3-MXX-101/15 - Course of English for PhD Studies (1)

Course requirements:

Learning outcomes:

Class syllabus:

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 161

A	ABS	B	C	D	E	FX	NEABS
54,66	38,51	0,0	0,0	0,0	0,0	0,0	6,83

Lecturers: PhDr. Alena Zemanová

Last change: 20.06.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-806/10	Creation of Teaching Texts and Aids

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 6

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Creation of teaching texts
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The student will master the methodology of creating a teaching aid or textbook.

Class syllabus:
Consultations with the leader of the author's team. Assistance to the leader of the author's team with the elaboration of the teaching text or the preparation of the teaching aid.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 1

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-809/10	Diploma Thesis Guidance

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 4

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Diploma thesis guidance
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The student will gain experience in leading the preparation of the final thesis.

Class syllabus:
Consultations provided to the student

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 2

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAFZM/3-FAA-990/15	**Course title:** Dissertation Thesis Admission
Number of credits: 30	
Recommended semester: 7., 8..	
Educational level: III.	
State exam syllabus:	
Last change: 02.06.2015	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-301/10	Foreign Periodical Cited in Current Contents

Educational activities:
Type of activities: independent work
Number of hours:
per week: 20 **per level/semester:** 260
Form of the course: on-site learning

Number of credits: 35

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
A publication in foreign periodical cited in current contents

Class syllabus:
Preparation of a research paper.

Recommended literature:
Study of current local and international research literature focusing on the topic of the dissertation advised by the supervisor and/or by a principal investigator of the research project and/or by the study programme guarantor.

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 2

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-303/10	Foreign Periodical not Cited in Current Contents

Educational activities:
Type of activities: independent work
Number of hours:
per week: 10 **per level/semester:** 130
Form of the course: on-site learning

Number of credits: 20

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
A publication in home periodical not cited in current contents

Class syllabus:
Preparation of a research paper.

Recommended literature:
Study of current local and international research literature focusing on the topic of the dissertation advised by the supervisor and/or by a principal investigator of the research project and/or by the study programme guarantor.

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-804/10	Guidance of the Students´ Research Project

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 7

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
100/0

Learning outcomes:
The student will gain experience in leading the preparation of work for a student scientific conference.

Class syllabus:
Proposal of the topic of the Student Scientific Conference. Consultations provided to the student. Elaboration of a report on the work.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers:

Last change: 19.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-302/10	Home Journal Cited in Current Contents

Educational activities:
Type of activities: independent work
Number of hours:
per week: 15 **per level/semester:** 195
Form of the course: on-site learning

Number of credits: 30

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
A publication in home periodical cited in current contents

Class syllabus:
Preparation of a research paper.

Recommended literature:
Study of current local and international research literature focusing on the topic of the dissertation advised by the supervisor and/or by a principal investigator of the research project and/or by the study programme guarantor.

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 1

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-304/10	Home Journal not Cited in Current Contents

Educational activities:
Type of activities: independent work
Number of hours:
per week: 10 **per level/semester:** 130
Form of the course: on-site learning

Number of credits: 15

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
A publication in home periodical not cited in current contents

Class syllabus:
Preparation of a research paper.

Recommended literature:
Study of current local and international research literature focusing on the topic of the dissertation advised by the supervisor and/or by a principal investigator of the research project and/or by the study programme guarantor.

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-703/10	Home Project Co-researcher

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 10

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The student will gain practical experience with the design, preparation and solution of a home scientific project.

Class syllabus:
Getting acquainted with the preparation of a scientific project. Participation in project solutions. Assistance in preparing the final report for the project.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 4

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 19.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-101/10	Individual Study of Science and Research Resources

Educational activities:
Type of activities: independent work
Number of hours:
per week: 10 **per level/semester:** 130
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 1.

Educational level: III.

Prerequisites:

Course requirements:
Continuous assessment, individual work
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The graduate will gain an overview of the topic of the dissertation and its the current state. They will learn methods of carrying out research and study information sources.

Class syllabus:
Study of current research literature advised by the supervisor. A creation of the schedule of the literature study and its evaluation by the supervisor.
Selection of literature.
Supervised studying of the scientific literature, presenting gained knowledge to the supervisor.
Overviewing the literature.

Recommended literature:
Selection of the literature by own choice and following advice of the supervisor. The used literature will be referred in the bibliography list.

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 5

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-102/10	Individual Study of Science and Research Resources

Educational activities:
Type of activities: independent work
Number of hours:
per week: 10 **per level/semester:** 130
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 2.

Educational level: III.

Prerequisites:

Course requirements:
Continuous assessment, individual work
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The graduate will gain an overview of the topic of the dissertation and its the current state. They will learn methods of carrying out research and study information sources.

Class syllabus:
Study of current research literature advised by the supervisor. A creation of the schedule of the literature study and its evaluation by the supervisor.
Selection of literature.
Supervised studying of the scientific literature, presenting gained knowledge to the supervisor.
Overviewing the literature.

Recommended literature:
Selection of the literature by own choice and following advice of the supervisor. The used literature will be referred in the bibliography list.

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 5

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-103/10	Individual Study of Science and Research Resources

Educational activities:
Type of activities: independent work
Number of hours:
per week: 10 **per level/semester:** 130
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 3.

Educational level: III.

Prerequisites:

Course requirements:
Continuous assessment, individual work
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The graduate will gain an overview of the topic of the dissertation and its the current state. They will learn methods of carrying out research and study information sources.

Class syllabus:
Study of current research literature advised by the supervisor. A creation of the schedule of the literature study and its evaluation by the supervisor.
Selection of literature.
Supervised studying of the scientific literature, presenting gained knowledge to the supervisor.
Overviewing the literature.

Recommended literature:
Selection of the literature by own choice and following advice of the supervisor. The used literature will be referred in the bibliography list.

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 4

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-104/10	Individual Study of Science and Research Resources

Educational activities:
Type of activities: independent work
Number of hours:
per week: 10 **per level/semester:** 130
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 4.

Educational level: III.

Prerequisites:

Course requirements:
Continuous assessment, individual work
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The graduate will gain an overview of the topic of the dissertation and its the current state. They will learn methods of carrying out research and study information sources.

Class syllabus:
Štúdium odbornej literatúry vybranej podľa doporučenia školiteľa. Stanovenie plánu kontrolovaného čítania školiteľom doktoranda
Výber literatúry
Kontrolované čítanie, referovanie o získaných poznatkoch školiteľovi
Rešeršná činnosť

Recommended literature:
Selection of the literature by own choice and following advice of the supervisor. The used literature will be referred in the bibliography list.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 4

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-702/10	International Project Co-researcher

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 15

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The student will gain practical experience with the design, preparation and solution of an international scientific project.

Class syllabus:
Getting acquainted with the preparation of a scientific project. Participation in project solutions. Communication with foreign partners. Participation in international working meetings. Assistance in preparing the final report for the project.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers:

Last change: 19.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-004/13	Mass Transfer in Close Binaries

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 2.

Educational level: III.

Prerequisites:

Course requirements:
50/50

Learning outcomes:
Deeper understanding of the basic types of mass transfer in close binaries. Creation of accretion disks. Outbursts.

Class syllabus:
Mass transfer from the donor in the binary by filling in the Roche-lobe, its subsequent transfer onto the accretor, the formation of the accretion disk and the energy release. Energy distribution in the spectrum of an accretion disk for a simplified case of an optically thick disk that radiates locally as a black body. Comparison of the theoretical model with observations. Mass transfer in binaries with very long orbital periods via the stellar wind from the donor star. An example for symbiotic stars. Possibilities of determining the mass-loss rate. Accretion from the wind by a compact component in a binary star. Outbursts of classic novae and symbiotic stars.

Recommended literature:
Ulrich Kolb, Extreme Environment Astrophysics, The open University, 2010 (ISBN 9780521187855)
selected articles

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers: RNDr. Augustín Skopal, DrSc.

Last change: 22.01.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAFZM/3-FAAau-020/13	**Course title:** Mathematical Statistics
Educational activities: **Type of activities:** lecture **Number of hours:** **per week:** 2 **per level/semester:** 26 **Form of the course:** on-site learning	
Number of credits: 10	
Recommended semester: 5.	
Educational level: III.	
Prerequisites:	
Course requirements:	
Learning outcomes:	
Class syllabus:	
Recommended literature:	
Languages necessary to complete the course:	
Notes:	

Past grade distribution
Total number of evaluated students: 2

ABS	NEABS
100,0	0,0

Lecturers: RNDr. Luboš Neslušan, CSc.
Last change:
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-307/10	Non-reviewed Foreign Papers Volume

Educational activities:
Type of activities: independent work
Number of hours:
per week: 5 **per level/semester:** 65
Form of the course: on-site learning

Number of credits: 5

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
A publication in foreign non-reviewed proceedings

Class syllabus:

Recommended literature:
Study of current local and international research literature focusing on the topic of the dissertation advised by the supervisor and/or by a principal investigator of the research project and/or by the study programme guarantor.

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-308/10	Non-reviewed Home Papers Volume

Educational activities:
Type of activities: independent work
Number of hours:
per week: 5 **per level/semester:** 65
Form of the course: on-site learning

Number of credits: 5

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
A publication in home non-reviewed foreign proceedings

Class syllabus:
Preparation of a research paper.

Recommended literature:
Study of current local and international research literature focusing on the topic of the dissertation advised by the supervisor and/or by a principal investigator of the research project and/or by the study programme guarantor.

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KJFB/3-FAA-006/00	Nuclear Astronomy and Astrophysics

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 2.

Educational level: III.

Prerequisites:

Course requirements:
Continuous assessment: individual work
Exam

Learning outcomes:
The application of nuclear physical knowledge in the field of astronomy and astrophysics.

Class syllabus:
Basics theory of nucleosynthesis, primordial, antropogenic and cosmogenic nuclides. Principles of nuclear radiometric methods, dating, catastrophic events and their investigation by nuclear methods. Position of the Earth in the Solar system. Isotpos and their applications in Solar system formation chronometry. Space, chemical elemnts in it and their abundances in various objects of Solar system.
Note
The selection of the given topics will be made by the supervisor according to the focus of the dissertation.

Recommended literature:
Ringwood, A. E.: Origin of the Earth and Moon. Springer-Verlag, 1979.
Cox, P. A.: The Elements on the Earth.
Dalrymple, G. B.: The Age of the Earth.
Press, F., Siever, R.: Earth. W. H. Freeman and Company, 1978.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers: prof. RNDr. Jozef Masarik, DrSc.

Last change: 21.06.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-018/13	Numerical Methods in Celestial Mechanics

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 3.

Educational level: III.

Prerequisites:

Recommended prerequisites:
Celestial mechanics

Course requirements:
30/70
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
Knowledge about the numerical integration of orbits, some integration algorithms, and about the software as well as the hardware tools/equipment that are necessary to perform the robust numerical simulations (i.e. to study an evolution of orbits of large number of objects for a long period).

Class syllabus:
A summary of basic knowledge in celestial mechanics (charakteristics of Keplerian orbit, perturbations, transformations of coordinate systems used in astronomy). Calculation of radius and velocity vectors of planet Earth in given time. Numerical integration of orbits. Runge-Kutta Method. Integrators RA15 and Leap-Frog. Introduction to OS Unix/Linux. Programing of integration algoritms. Using an infrastructure for the high-performance computing (SIVVP, GRID and CLOUD).

Recommended literature:
Brouwer D., Clemence G. M.: Methods of Celestial Mechanics. Academic Press, New York and London, 1961.
Roy A. E.: Orbital Motion. 3-rd ed. Adam Hilger, Bristol and Philadelphia, 1988.
Neslušan L.: Elementárny úvod do nebeskej mechaniky. VEDA, Bratislava, 2017.
Everhart E.: An efficient integrator that uses Gauss-Radau spacings. In Dynamics of Comets: Their
Origin and Evolution, ed. A. Carusi a G. B. Valsecchi, D.Reidel, Dordrecht, pp. 185-202.
Bretagnon P.: Théorie du mouvement de l´ensemble des planètes. Solution VSOP82. Astronomy and
Astrophysics, Vol. 114 (1982), pp. 278-288.

Dynamics of Small Solar systém Bodies and Exoplanets. Ed. J. Souchay a R. Dvorak, Springer, Heidelberg, 2010.

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers: RNDr. Luboš Neslušan, CSc.

Last change: 22.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-701/10	Obtaining a University Grant

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 20

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
100/0

Learning outcomes:
The doctoral student will gain practical experience with the preparation of a scientific project, its solution, and writing a final report.

Class syllabus:
Preparation of a scientific project within the UK Grants program. Project solution. Preparation of the final report on the project. Closing the project.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 7

ABS	NEABS
85,71	14,29

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-805/10	Participation in a Conference Organising Committee

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 3

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
100/0

Learning outcomes:
The student will gain practical experience in organizing scientific events and communicating with conference participants.

Class syllabus:
Participation in activities related to the organization of the conference.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers:

Last change: 19.01.2022

Approved by:

STATE EXAM DESCRIPTION

Academic year: 2021/2022	
University: Comenius University Bratislava	
Faculty: Faculty of Mathematics, Physics and Informatics	
Course ID: FMFI.KAFZM/3-FAA-950/15	**Course title:** Passing Dissertation Examination
Number of credits: 20	
Recommended semester: 3., 4..	
Educational level: III.	
State exam syllabus:	
Last change: 02.06.2015	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-015/13	Physics of Stars and Binaries of Late Spectral Types

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 1.

Educational level: III.

Prerequisites:

Course requirements:
50/50
Scale of assessment (preliminary/final): 50/50

Learning outcomes:
To gain detailed knowledge on single and binary stars of late spectral types (red giant, T Tauri stars, carbon stars, etc.)
.

Class syllabus:
Stars of late spectral types are stellar objects with a surface temperature lower than the surface temperature of the Sun. Their spectral types are usually K, M, C, and S, respectively. Often, G-type stars are also included in this group. Late-type stars can be either low-mass if they are on the main sequence, or more massive than the Sun, if they are giants or super giants.

Recommended literature:
- C.W.H. de Loore and C. Doom, Structure and evolution of single and binary stars. Kluwer Academic Publisher (1992). (ISBN 0-7923-1768-8).
- výber aktuálnych článkov

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers: Mgr. Martin Vaňko, PhD.

Last change: 22.01.2022
Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-009/00	Planetary Cosmogony

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 3.

Educational level: III.

Prerequisites:

Course requirements:
Continuous assessment: preparation and presentation of a paper.
Final examination: oral exam.
Approximate scale of final grades: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 40/60

Learning outcomes:
The graduate of the course will deepen theoretical knowledge of models of the origin and development of planetary systems and will have an overview in the most recent publications in the field of planetary science.

Class syllabus:
Historical models of the formation of the Solar System. Nucleogenesis of chemical elements and their cosmic abundances. Gravitational collapse and the Jeans criterion. Solar System formation, standard model, chemical condensation equilibrium theory of dust formation. Turbulence in protoplanetary disks, collisional growth of planetesimals. Protoplanetary disk structure. Massive disk model - gaseous planets, planet migration. Chronology of the formation of Solar System bodies. Other planetary systems, circumstellar dust disks, the cycle of matter in interstellar clouds.

Recommended literature:
Sun Kwok: The Origin and Evolution of Planetary Nebulae. Cambridge University Press, 2000
G. A. Gurzadyan: The Physics and Dynamics of Planetary Nebulae. Springer, 1997
W. Benz et al.: From dust to terrestrial planets. Proceedings of an ISSI Workshop, Bern, Kluwer Ac. Publishers, 1999
E.H. Levy, J.I. Lunine: Protostars and Planets III. The Univ. of Arizona Press, Tuscon, 1999
V. Mannings, A.P. Boss, S.S. Pressell (Ed.): Protostars and Planets IV. The Univ. of Arizona Press, Tuscon, 2000

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers: doc. RNDr. Sebastián Ševčík, CSc.	
Last change: 20.06.2022	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-001/00	Population of the Small Bodies of the Solar System (1)

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 1.

Educational level: III.

Prerequisites:

Course requirements:
Continuous assessment, exam

Learning outcomes:
The student will gain the latest knowledge from the research of the population of meteoroids and interplanetary dust.

Class syllabus:
Meteoroid population – components; interaction of meteoroids with the atmosphere and meteor physics; observational methods – photographic, radio, TV, meteor spectra; micrometeoroids, interplanetary dust; zodiacal light; meteoroid population – structure; sporadic meteors, activity variations, sources; selection effects; meteoroid streams - activity, structure, origin and evolution; meteor complexes, associations of potential parent bodies; influx of meteor matter on the Earth; interaction of large meteoroids with the atmosphere, falls of meteorites' accompanying effects, classification of meteorites – structure, chemical composition, mineralogy; meteor crates, ages of meteorites, origin of meteorites and their parent bodies.
Note: The supervisor will make a selection of the given topics according to the focus of the dissertation.

Recommended literature:
Murrad E., Williams I.P.: 2002, Meteors in the Earth's Atmosphere. Cambridge, London
McDonnell J.A.M.: 1978, Cosmic Dust. John Wiley & Sons, New York, Toronto
McKinley D.W.R.: 1961, Meteor science and engineering. McGraw-Hill Comp., New York
Heide F., Wlotzka F.: 1995, Meteorites. Springer, Berlin, Heidelberg, New York
McSween H.Y.: 1999, Meteorites and their parent bodies. Cambridge Univ. Press, Cambridge.
Buchwald, F.: 1975, Handbook od iron meteorites, Vol. 1-3, Univ. of California Press, Berkeley
Current monographs and papers.

Languages necessary to complete the course:

Notes:

Past grade distribution Total number of evaluated students: 3	
ABS	NEABS
100,0	0,0
Lecturers: doc. RNDr. Leonard Kornoš, PhD.	
Last change: 17.02.2022	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-002/00	Population of the Small Bodies of the Solar System (2)

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 2.

Educational level: III.

Prerequisites:

Course requirements:
Continuous assessment: semestral work.
Final examination: oral exam.
Approximate scale of final grades: A 90%, B 80%, C 70%, D 60%, E 50%
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
Detailed knowledge of populations of asteroids, comets and ice bodies of the Edgeworth-Kuiper belt. Extension of knowledge from II. degree.

Class syllabus:
Distribution of asteroids in the Solar System, commensurabilities, asteroid families, asteroids on special orbits. Asteroid structure, taxonomic types and their incidence depending on heliocentric distance, near-Earth asteroids, Trojans and centaurs. Comets at large heliocentric distances, new comets in the Oort´s sense, Oort cloud. Ice objects of the Edgeworth-Kuiper belt, Pluto and Charon. Origin and evolution of individual populations of interplanetary matter and their interrelationships.

Recommended literature:
Michel, P., Demeo, F.E., Bottke, W.F.: Asteroids IV, Tucson, University of Arizona Press, 2015.
Festou, M.C., Keller, H.U., Weaver, H.A.: Comets II, Tucson, University of Arizona Press, 2004.
Fernández. J.A., Lazzaro, D., Prialnik, D., Schulz, R.: Icy Bodies of the Solar System, Cambridge University Press, 2010.

Languages necessary to complete the course:
Slovak / English

Notes:
Jazyk, ktorého znalosť je potrebná na absolvovanie predmetu: anglický

Past grade distribution Total number of evaluated students: 4	
ABS	NEABS
100,0	0,0
Lecturers: doc. RNDr. Ján Svoreň, DrSc., doc. RNDr. Leonard Kornoš, PhD.	
Last change: 20.06.2022	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-404/10	Presentation at a Department Seminar

Educational activities:
Type of activities: independent work
Number of hours:
per week: 5 **per level/semester:** 65
Form of the course: on-site learning

Number of credits: 5

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Presentation of the research results at the seminar

Class syllabus:
Preparation of the results and the seminar contribution.

Recommended literature:
selected articles

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 1

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-403/10	Presentation at a Home Conference

Educational activities:
Type of activities: independent work
Number of hours:
per week: 7 **per level/semester:** 91
Form of the course: on-site learning

Number of credits: 10

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Presentation of the research results at the conference.

Class syllabus:
Preparation of the results and the conference contribution.

Recommended literature:
selected articles

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 6

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-402/10	Presentation at a Home Conference with International Participation

Educational activities:
Type of activities: independent work
Number of hours:
per week: 10 **per level/semester:** 130
Form of the course: on-site learning

Number of credits: 15

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Presentation of the research results at the conference.

Class syllabus:
Preparation of the results and the conference contribution.

Recommended literature:
slected articles

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 1

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-401/10	Presentation at an International Conference

Educational activities:
Type of activities: independent work
Number of hours:
per week: 10 **per level/semester:** 130
Form of the course: on-site learning

Number of credits: 20

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Presentation of the research results at an international conference.

Class syllabus:
Preparation of the results and the conference contribution.

Recommended literature:
selected articles

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 3

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-704/10	Quotation Registered in SCI or SCOPUS

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 4

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Citation. By obtaining a registered response to their work, the student demonstrates the relevance of their own research.

Class syllabus:
Citation of the doctoral student's contribution in a publication without self-citation

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers:

Last change: 19.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-707/10	Quotation in a Home Scientific Journal

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 2

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
100/0
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Citation. By obtaining a registered response to their work, the student demonstrates the relevance of their own research.

Class syllabus:
Citation of the doctoral student's contribution in a publication without self-citation

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers:

Last change: 19.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-705/10	Quotation in a Monograph

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 4

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
100/0

Learning outcomes:
Citation. By obtaining a registered response to their work, the student demonstrates the relevance of their own research.

Class syllabus:
Citation of the doctoral student's contribution in a publication without self-citation

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers:

Last change: 19.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-706/10	Quotation in a Scientific Journal Abroad

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 3

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
100/0

Learning outcomes:
Citation. By obtaining a registered response to their work, the student demonstrates the relevance of their own research.

Class syllabus:
Citation of the doctoral student's contribution in a publication without self-citation

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers:

Last change: 19.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-016/13	Research of the Solar Photosphere and Chromosphere

Educational activities:
Type of activities: lecture
Number of hours:
per week: 1 **per level/semester:** 13
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 2.

Educational level: III.

Prerequisites:

Course requirements:
20/80
Scale of assessment (preliminary/final): 20/80

Learning outcomes:
Detailed knowledge of the physical properties of the lower layers of the solar atmosphere and the active phenomena taking place in these layers.

Class syllabus:
Solar photosphere, physical parameters, observation methods, radiation transfer in the photosphere - LTE, solar granulation, solar chromosphere, physical parameters, observation methods. radiation transfer in the chromosphere - NLTE, active phenomena in the chromosphere - chromospheric network, spicules, models of the solar photosphere and chromosphere.

Recommended literature:
Bellot Rubio, L., Orozco Suárez, D. Quiet Sun magnetic fields: an observational view. Living Rev Sol Phys 16, 1 (2019). https://doi.org/10.1007/s41116-018-0017-1
Mats Carlsson, Bart De Pontieu, Viggo H. Hansteen, New View of the Solar Chromosphere Annual Review of Astronomy and Astrophysics 2019 57:1, 189-226
M. Stix: The Sun, An Introduction, Springer, 2nd edition, 2002.
Zirin, Harold., Astrophysics of the Sun, Cambridge Univ. Press, Cambridge, 1988
E. R. Priest: Magnetohydrodynamics of the Sun, Cambridge University Press, 2014.
P.A. Sturrock, T. E. Holzer, D.M. Mihalas, R.K. Ulrich, Physics of the Sun I. II. III. Geophysics and Astrophysics Monorgaphs, Riedel Publ. Dodrecht 1968

Languages necessary to complete the course:
English

Notes:
Languages necessary to complete the course: English

Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers: RNDr. Aleš Kučera, CSc.	
Last change: 22.01.2022	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-017/13	Research of the Transition Region and Corona of the Sun by Space Instrumentation

Educational activities:
Type of activities: lecture
Number of hours:
per week: 1 **per level/semester:** 13
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 2.

Educational level: III.

Prerequisites:

Course requirements:
30/50
Scale of assessment (preliminary/final): 30/50

Learning outcomes:
Obtaining of more detailed knowledge on basics technical and observational research possibilities of the transition layer and corona of the Sun by space-born instrumentation and on unique knowledge, which are acquired about the Sun and its atmosphere exclusively by this way.

Class syllabus:
Knowledge on the transition region and corona of the Sun: historical development and current status, observational possibilities of the ground-based and space-born observations. Instrumental approaches and the methods of the space-born observations of the transition region and corona of the Sun. Physics of the coronal emission lines. Models of the transition region and solar corona. Space-born instrumentation – past, actual and planned instruments: UV spectrometers, UV telescopes and filters, coronagraphs. Interpretation possibilities of the transition tegion and solar corona observations.

Recommended literature:
• The Solar Transition Region. Cambridge Astrophysics Series, by Mariska, John T., Edition: 1 Publisher: Cambridge Cambridge University Press 1992
• Ultraviolet and X-ray Spectroscopy of the Solar Atmosphere, by Phillips, Kenneth J.H, Feldman, U., Landi, E., Edition: 1 Publisher: Cambridge Cambridge University Press 2008
• Physics of the Solar Corona, by Aschwanden, Markus J., Edition: 1,2, Publisher: Chichester Praxis Publishing 2004, 2006

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers: RNDr. Ján Rybák, CSc.	
Last change: 22.01.2022	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-305/10	Reviewed Foreign Papers Volume

Educational activities:
Type of activities: independent work
Number of hours:
per week: 15 **per level/semester:** 195
Form of the course: on-site learning

Number of credits: 30

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
A publication in foreign peer-reviewed proceedings

Class syllabus:
Preparation of a research paper.

Recommended literature:
Study of current local and international research literature focusing on the topic of the dissertation advised by the supervisor and/or by a principal investigator of the research project and/or by the study programme guarantor.

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 2

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-306/10	Reviewed Home Papers Volume

Educational activities:
Type of activities: independent work
Number of hours:
per week: 10 **per level/semester:** 130
Form of the course: on-site learning

Number of credits: 15

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
A publication in home peer-reviewed proceedings

Class syllabus:
Preparation of a research paper.

Recommended literature:
Study of current local and international research literature focusing on the topic of the dissertation advised by the supervisor and/or by a principal investigator of the research project and/or by the study programme guarantor.

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-511/15	Science Thesis (1)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 15

Recommended semester: 5., 6..

Educational level: III.

Prerequisites:

Course requirements:
Obtaining scientific results
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The PhD. student will gain and expand the ability to work individually as well as in team during conducting his/her research activities connected to the PhD. project, writing research papers.

Class syllabus:
Individual research of the PhD. student represents a crucial part of the PhD. studies.
Individual approach to solving open scientific problems. Original and individual results under supervision of the supervisor.

Recommended literature:
Relevant scientific papers

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 6

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-512/15	Science Thesis (2)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 15

Recommended semester: 5., 6..

Educational level: III.

Prerequisites:

Course requirements:
Obtaining scientific results
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The PhD. student will gain and expand the ability to work individually as well as in team during conducting his/her research activities connected to the PhD. project, writing research papers.

Class syllabus:
Individual research of the PhD. student represents a crucial part of the PhD. studies.
Individual approach to solving open scientific problems. Original and individual results under supervision of the supervisor.

Recommended literature:
Relevant scientific papers

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 7

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-513/15	Science Thesis (3)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 20

Recommended semester: 7., 8..

Educational level: III.

Prerequisites:

Course requirements:
Obtaining scientific results
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The PhD. student will gain and expand the ability to work individually as well as in team during conducting his/her research activities connected to the PhD. project, writing research papers.

Class syllabus:
Individual research of the PhD. student represents a crucial part of the PhD. studies.
Individual approach to solving open scientific problems. Original and individual results under supervision of the supervisor.

Recommended literature:
Relevant scientific papers

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 6

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-514/15	Science Thesis (4)

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 20

Recommended semester: 7., 8..

Educational level: III.

Prerequisites:

Course requirements:
Obtaining scientific results
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The PhD. student will gain and expand the ability to work individually as well as in team during conducting his/her research activities connected to the PhD. project, writing research papers.

Class syllabus:
Individual research of the PhD. student represents a crucial part of the PhD. studies.
Individual approach to solving open scientific problems. Original and individual results under supervision of the supervisor.

Recommended literature:
Relevant scientific papers

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 6

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-003/00	Selected Topics of Solar Physics

Educational activities:
Type of activities: lecture
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 10

Recommended semester: 1.

Educational level: III.

Prerequisites:

Course requirements:
Continuous assessment, individual work
Exam
Scale of assessment (preliminary/final): 30/70

Learning outcomes:
A deeper understanding of the processes in the physics of the Sun.

Class syllabus:
The course is realized in the form of lectures in which deeper information about existing knowledge and the most current findings from the field of Solar physics will be conveyed. The contents of the lectures are the following topics: basic definitions and assumptions, basic physical facts about the Sun, internal structure of the Sun, energy production, the problem of solar neutrinos, energy transfer by radiation and convection, helioseismology, solar atmosphere, photospheric radiation and photospheric structures, chromosphere, transition region and corona, optically thin radiation, solar flares, coronal mass ejections, magnetic fields in the solar atmosphere, measurements of the magnetic field strength, Stokes parameters, basic MHD equations, solar dynamics, differential rotation and its description, Standard model of the Sun, solar activity and its cycle, solar wind, solar-earth relations, space weather. The supervisor will make a choice of the given topics according to the focus of the dissertation.

Recommended literature:
Zirin, H.: Astrophysics of the Sun, Cambridge Univ. Press, Cambridge, 1988
Priest, E. R.: Solar Magnetohydrodynamics, D. Reidel Publishing Company, 1982
M. Stix: The Sun, An Introduction, Springer, 2nd edition, 2002.

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution Total number of evaluated students: 0	
ABS	NEABS
0,0	0,0
Lecturers: doc. RNDr. Elena Dzifčáková, CSc.	
Last change: 17.02.2022	
Approved by:	

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-105/13	Seminar on Astronomy and Astrophysics (1)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 1 **per level/semester:** 13
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 1.

Educational level: III.

Prerequisites:

Course requirements:
100/0
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Gaining experience in the presentation of scientific results. Preparation for your own presentation at a seminar or scientific conferences.

Class syllabus:
Mandatory participation in scientific seminars organized by the Scientific Secretary of the Astronomical Institute. The scientific content of the seminars is a regular presentation of the latest research results presented by researcher and their guests. A student should gain a broader overview of the main research directions of the Astronomical Institute as well as get acquainted with the basic principles of presentation of scientific results.

Recommended literature:
not required

Languages necessary to complete the course:
English

Notes:
Language necessary to complete the course: English

Past grade distribution
Total number of evaluated students: 1

ABS	NEABS
100,0	0,0

Lecturers: Mgr. Martin Vaňko, PhD.

Last change: 22.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-106/13	Seminar on Astronomy and Astrophysics (2)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 1 **per level/semester:** 13
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 2.

Educational level: III.

Prerequisites:

Course requirements:
100/0
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Gaining experience in the presentation of scientific results. Preparation for your own presentation at a seminar or scientific conferences.

Class syllabus:
Mandatory participation in scientific seminars organized by the Scientific Secretary of the Astronomical Institute. The scientific content of the seminars is a regular presentation of the latest research results presented by researcher and their guests. A student should gain a broader overview of the main research directions of the Astronomical Institute as well as get acquainted with the basic principles of presentation of scientific results.

Recommended literature:
not required

Languages necessary to complete the course:
English

Notes:
Language necessary to complete the course: English

Past grade distribution
Total number of evaluated students: 1

ABS	NEABS
100,0	0,0

Lecturers: Mgr. Martin Vaňko, PhD.

Last change: 22.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-107/13	Seminar on Astronomy and Astrophysics (3)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 1 **per level/semester:** 13
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 3.

Educational level: III.

Prerequisites:

Course requirements:
100/0
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Gaining experience in the presentation of scientific results. Preparation for your own presentation at a seminar or scientific conferences.

Class syllabus:
Mandatory participation in scientific seminars organized by the Scientific Secretary of the Astronomical Institute. The scientific content of the seminars is a regular presentation of the latest research results presented by researcher and their guests. A student should gain a broader overview of the main research directions of the Astronomical Institute as well as get acquainted with the basic principles of presentation of scientific results.

Recommended literature:
not required

Languages necessary to complete the course:
English

Notes:
Language necessary to complete the course: English

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers: Mgr. Martin Vaňko, PhD.

Last change: 22.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-108/13	Seminar on Astronomy and Astrophysics (4)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 1 **per level/semester:** 13
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 4.

Educational level: III.

Prerequisites:

Course requirements:
100/0
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Gaining experience in the presentation of scientific results. Preparation for your own presentation at a seminar or scientific conferences.

Class syllabus:
Mandatory participation in scientific seminars organized by the Scientific Secretary of the Astronomical Institute. The scientific content of the seminars is a regular presentation of the latest research results presented by researcher and their guests. A student should gain a broader overview of the main research directions of the Astronomical Institute as well as get acquainted with the basic principles of presentation of scientific results.

Recommended literature:
not required

Languages necessary to complete the course:
English

Notes:
Language necessary to complete the course: English

Past grade distribution
Total number of evaluated students: 0

ABS	NEABS
0,0	0,0

Lecturers: Mgr. Martin Vaňko, PhD.

Last change: 22.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-109/13	Seminar on Astronomy and Astrophysics (5)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 1 **per level/semester:** 13
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 5.

Educational level: III.

Prerequisites:

Course requirements:
100/0
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Gaining experience in the presentation of scientific results. Preparation for your own presentation at a seminar or scientific conferences.

Class syllabus:
Mandatory participation in scientific seminars organized by the Scientific Secretary of the Astronomical Institute. The scientific content of the seminars is a regular presentation of the latest research results presented by researcher and their guests. A student should gain a broader overview of the main research directions of the Astronomical Institute as well as get acquainted with the basic principles of presentation of scientific results.

Recommended literature:
not required

Languages necessary to complete the course:
English

Notes:
Language necessary to complete the course: English

Past grade distribution
Total number of evaluated students: 2

ABS	NEABS
100,0	0,0

Lecturers: Mgr. Martin Vaňko, PhD.

Last change: 22.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-110/13	Seminar on Astronomy and Astrophysics (6)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 1 **per level/semester:** 13
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 6.

Educational level: III.

Prerequisites:

Course requirements:
100/0
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Gaining experience in the presentation of scientific results. Preparation for your own presentation at a seminar or scientific conferences.

Class syllabus:
Mandatory participation in scientific seminars organized by the Scientific Secretary of the Astronomical Institute. The scientific content of the seminars is a regular presentation of the latest research results presented by researcher and their guests. A student should gain a broader overview of the main research directions of the Astronomical Institute as well as get acquainted with the basic principles of presentation of scientific results.

Recommended literature:
not required

Languages necessary to complete the course:
English

Notes:
Language necessary to complete the course: English

Past grade distribution
Total number of evaluated students: 2

ABS	NEABS
100,0	0,0

Lecturers: Mgr. Martin Vaňko, PhD.

Last change: 22.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-111/13	Seminar on Astronomy and Astrophysics (7)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 1 **per level/semester:** 13
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 7.

Educational level: III.

Prerequisites:

Course requirements:
100/0
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Gaining experience in the presentation of scientific results. Preparation for your own presentation at a seminar or scientific conferences.

Class syllabus:
Mandatory participation in scientific seminars organized by the Scientific Secretary of the Astronomical Institute. The scientific content of the seminars is a regular presentation of the latest research results presented by researcher and their guests. A student should gain a broader overview of the main research directions of the Astronomical Institute as well as get acquainted with the basic principles of presentation of scientific results.

Recommended literature:
not required

Languages necessary to complete the course:
English

Notes:
Language necessary to complete the course: English

Past grade distribution
Total number of evaluated students: 3

ABS	NEABS
100,0	0,0

Lecturers: Mgr. Martin Vaňko, PhD.

Last change: 22.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAAau-112/13	Seminar on Astronomy and Astrophysics (8)

Educational activities:
Type of activities: seminar
Number of hours:
per week: 1 **per level/semester:** 13
Form of the course: on-site learning

Number of credits: 5

Recommended semester: 8.

Educational level: III.

Prerequisites:

Course requirements:
100/0
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
Gaining experience in the presentation of scientific results. Preparation for your own presentation at a seminar or scientific conferences.

Class syllabus:
Mandatory participation in scientific seminars organized by the Scientific Secretary of the Astronomical Institute. The scientific content of the seminars is a regular presentation of the latest research results presented by researcher and their guests. A student should gain a broader overview of the main research directions of the Astronomical Institute as well as get acquainted with the basic principles of presentation of scientific results.

Recommended literature:
not required

Languages necessary to complete the course:
English

Notes:
Language necessary to complete the course: English

Past grade distribution
Total number of evaluated students: 3

ABS	NEABS
100,0	0,0

Lecturers: Mgr. Martin Vaňko, PhD.

Last change: 22.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-807/10	Study Stay Abroad

Educational activities:
Type of activities:
Number of hours:
per week: **per level/semester:**
Form of the course: on-site learning

Number of credits: 3

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
100/0

Learning outcomes:
The student will gain valuable experience with teaching and research in a foreign institution.

Class syllabus:
Completion of a study stay abroad.

Recommended literature:

Languages necessary to complete the course:

Notes:

Past grade distribution
Total number of evaluated students: 2

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 19.01.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-801/10	Supervising and Demonstrating Work

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Regular student's weekly teaching.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The PhD student will gain teaching and pedagogical skills by leading practicals and exercises.

Class syllabus:
Regular student's weekly teaching.
Consultations with the lecturer.
Evaluation of tests and assignments.
Providing assistance to the lecturer during final examinations.

Recommended literature:

Languages necessary to complete the course:
Slovak / English

Notes:

Past grade distribution
Total number of evaluated students: 11

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by:

COURSE DESCRIPTION

Academic year: 2021/2022

University: Comenius University Bratislava

Faculty: Faculty of Mathematics, Physics and Informatics

Course ID:	**Course title:**
FMFI.KAFZM/3-FAA-802/10	Supervising and Demonstrating Work

Educational activities:
Type of activities: practicals
Number of hours:
per week: 2 **per level/semester:** 26
Form of the course: on-site learning

Number of credits: 5

Recommended semester:

Educational level: III.

Prerequisites:

Course requirements:
Regular student's weekly teaching.
Scale of assessment (preliminary/final): 100/0

Learning outcomes:
The PhD student will gain teaching and pedagogical skills by leading practicals and exercises.

Class syllabus:
Regular student's weekly teaching.
Consultations with the lecturer.
Evaluation of tests and assignments.
Providing assistance to the lecturer during final examinations.

Recommended literature:

Languages necessary to complete the course:
SLovak / English

Notes:

Past grade distribution
Total number of evaluated students: 7

ABS	NEABS
100,0	0,0

Lecturers:

Last change: 17.02.2022

Approved by: