

## Course descriptions

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## COURSE DESCRIPTION

|                                                                                                                                                                                                                          |       |                                                 |      |      |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------------------------|------|------|-----|
| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                     |       |                                                 |      |      |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                          |       |                                                 |      |      |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-204/15                                                                                                                                                                              |       | <b>Course title:</b><br>Applied Nuclear Physics |      |      |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture / practicals<br><b>Number of hours:</b><br><b>per week:</b> 3 / 1 <b>per level/semester:</b> 42 / 14<br><b>Form of the course:</b> on-site learning |       |                                                 |      |      |     |
| <b>Number of credits:</b> 5                                                                                                                                                                                              |       |                                                 |      |      |     |
| <b>Recommended semester:</b> 3.                                                                                                                                                                                          |       |                                                 |      |      |     |
| <b>Educational level:</b> II.                                                                                                                                                                                            |       |                                                 |      |      |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                    |       |                                                 |      |      |     |
| <b>Course requirements:</b>                                                                                                                                                                                              |       |                                                 |      |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                |       |                                                 |      |      |     |
| <b>Class syllabus:</b>                                                                                                                                                                                                   |       |                                                 |      |      |     |
| <b>Recommended literature:</b>                                                                                                                                                                                           |       |                                                 |      |      |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                       |       |                                                 |      |      |     |
| <b>Notes:</b>                                                                                                                                                                                                            |       |                                                 |      |      |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 21                                                                                                                                                 |       |                                                 |      |      |     |
| A                                                                                                                                                                                                                        | B     | C                                               | D    | E    | FX  |
| 33,33                                                                                                                                                                                                                    | 33,33 | 14,29                                           | 9,52 | 9,52 | 0,0 |
| <b>Lecturers:</b> doc. RNDr. Karol Holý, CSc., RNDr. Radoslav Böhm, PhD.                                                                                                                                                 |       |                                                 |      |      |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                           |       |                                                 |      |      |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                     |       |                                                 |      |      |     |

## STATE EXAM DESCRIPTION

|                                                                 |                                                 |
|-----------------------------------------------------------------|-------------------------------------------------|
| <b>University:</b> Comenius University in Bratislava            |                                                 |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics |                                                 |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-957/15                     | <b>Course title:</b><br>Applied Nuclear Physics |
| <b>Number of credits:</b> 2                                     |                                                 |
| <b>Educational level:</b> II.                                   |                                                 |
| <b>State exam syllabus:</b>                                     |                                                 |
| <b>Last change:</b> 02.06.2015                                  |                                                 |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.            |                                                 |

## COURSE DESCRIPTION

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                      |     |                                                                  |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                           |     |                                                                  |     |     |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-238/00                                                                                                                                                                                                                                                                                                                                                                                                               |     | <b>Course title:</b><br>Biological Effects of Ionizing Radiation |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week: 2 per level/semester: 28</b><br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                               |     |                                                                  |     |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                                                  |     |     |     |
| <b>Recommended semester:</b> 4.                                                                                                                                                                                                                                                                                                                                                                                                                           |     |                                                                  |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                                                  |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |                                                                  |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                                                  |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |                                                                  |     |     |     |
| <b>Class syllabus:</b><br>The temporal course of radiation effects. Cellular and subcellular radiobiology. Theories and models for cell survival. Radiation effects of particles with high linear energy transfer (LET, Bragg peak, dependence RBE on LET, direct and indirect action, fractionation of exposure). Late effects of radiation on tissue (stochastic and nonstochastic effects). Radiation biology of normal and neoplastic tissue systems. |     |                                                                  |     |     |     |
| <b>Recommended literature:</b><br>Alpen E.L.: Radiation Biophysics, Academic Press, San Diego, 1998<br>Nias A.H.W.: An introduction to radiobiology, Wiley, Chichester, 2000<br>Alberts B., Bray D., Lewis J., Raff M., Roberts K., Watson J.D.: Molecular Biology of the Cell, Garland Publ., NY 1994                                                                                                                                                    |     |                                                                  |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                        |     |                                                                  |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                                                  |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 10                                                                                                                                                                                                                                                                                                                                                                                  |     |                                                                  |     |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                         | B   | C                                                                | D   | E   | FX  |
| 100,0                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0,0 | 0,0                                                              | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> RNDr. Radoslav Böhm, PhD.                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                                                  |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                                                                  |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                      |     |                                                                  |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                               |     |                                           |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                    |     |                                           |     |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-230/15                                                                                                                                                        |     | <b>Course title:</b><br>Computer Networks |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |     |                                           |     |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                        |     |                                           |     |     |     |
| <b>Recommended semester:</b> 3.                                                                                                                                                                    |     |                                           |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                      |     |                                           |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                              |     |                                           |     |     |     |
| <b>Antirequisites:</b> FMFI.KJFB/2-FJF-230/00                                                                                                                                                      |     |                                           |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                        |     |                                           |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                          |     |                                           |     |     |     |
| <b>Class syllabus:</b>                                                                                                                                                                             |     |                                           |     |     |     |
| <b>Recommended literature:</b>                                                                                                                                                                     |     |                                           |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                 |     |                                           |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                      |     |                                           |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 1                                                                                                                            |     |                                           |     |     |     |
| A                                                                                                                                                                                                  | B   | C                                         | D   | E   | FX  |
| 100,0                                                                                                                                                                                              | 0,0 | 0,0                                       | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Stanislav Tokár, DrSc., RNDr. Tibor Ženiš, PhD.                                                                                                                      |     |                                           |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                     |     |                                           |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                               |     |                                           |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                                  |      |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                                  |      |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-236/00                                                                                                                                                                                                                                                                                                                                                                                                                                              |       | <b>Course title:</b><br>Detection Methods in High Energy Physics |      |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                                       |       |                                                                  |      |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                                  |      |     |     |
| <b>Recommended semester:</b> 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                                  |      |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                                                  |      |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                                  |      |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                                  |      |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                                                  |      |     |     |
| <b>Class syllabus:</b><br>Detectors for high energy physics. Magnetic spectrometers. Detectors used in colliders. Gas tracking detectors: proportional, drift and streamer chambers. Vertex detectors. Semiconductor and scintillating detectors. Gas coordinat detectors. Metods for particle identification. Measurements of ionization losses in the gas. Čerenkov detectors a hodoscopes. RIČH detectors. Transition radiation detectors. Callorimeters: electromagnetic and hadron. |       |                                                                  |      |     |     |
| <b>Recommended literature:</b><br>S.Usačev a kol. Experimentálna jadrová fyzika, SNTL, Bratislava, 1982<br>I.Úlehla, M.Suk, Z.Trka: Atomy, jadra, častice, Academie, Praha, 1990<br>B.Sitár, G.I.Merzon, V.A.Chechin, Yu.A.Budagov: Ionization measurements in high Energy physics. Springer Verlag, Berlin, Heidelberg, 1993<br>C.Grupen: Particle detectors. London, 1996.                                                                                                             |       |                                                                  |      |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                                                  |      |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                                                  |      |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 36                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                                                  |      |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | B     | C                                                                | D    | E   | FX  |
| 66,67                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 22,22 | 5,56                                                             | 5,56 | 0,0 | 0,0 |
| <b>Lecturers:</b> Mgr. Michal Mereš, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                                                  |      |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                                  |      |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                                  |      |     |     |

## COURSE DESCRIPTION

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava                                                                                                                                                        |      |                                            |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                             |      |                                            |     |     |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-910/00                                                                                                                                                                 |      | <b>Course title:</b><br>Diploma Thesis (1) |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> independent work<br><b>Number of hours:</b><br><b>per week:</b> 3 <b>per level/semester:</b> 42<br><b>Form of the course:</b> on-site learning |      |                                            |     |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                                 |      |                                            |     |     |     |
| <b>Recommended semester:</b> 2.                                                                                                                                                                             |      |                                            |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                               |      |                                            |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                       |      |                                            |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                 |      |                                            |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                   |      |                                            |     |     |     |
| <b>Class syllabus:</b><br>Student works according to instructions given by his/her diploma supervisor.                                                                                                      |      |                                            |     |     |     |
| <b>Recommended literature:</b><br>Recommended by diploma supervisor.                                                                                                                                        |      |                                            |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                          |      |                                            |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                               |      |                                            |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 68                                                                                                                                    |      |                                            |     |     |     |
| A                                                                                                                                                                                                           | B    | C                                          | D   | E   | FX  |
| 89,71                                                                                                                                                                                                       | 5,88 | 4,41                                       | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                          |      |                                            |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                              |      |                                            |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                        |      |                                            |     |     |     |

## COURSE DESCRIPTION

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava                                                                                                                                                 |      |                                            |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                      |      |                                            |     |     |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-911/00                                                                                                                                                          |      | <b>Course title:</b><br>Diploma Thesis (2) |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> independent work<br><b>Number of hours:</b><br><b>per week: 5 per level/semester: 70</b><br><b>Form of the course:</b> on-site learning |      |                                            |     |     |     |
| <b>Number of credits:</b> 5                                                                                                                                                                          |      |                                            |     |     |     |
| <b>Recommended semester:</b> 3.                                                                                                                                                                      |      |                                            |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                        |      |                                            |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                |      |                                            |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                          |      |                                            |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                            |      |                                            |     |     |     |
| <b>Class syllabus:</b><br>Student works according to instructions given by his/her diploma supervisor.                                                                                               |      |                                            |     |     |     |
| <b>Recommended literature:</b><br>Recommended by diploma supervisor.                                                                                                                                 |      |                                            |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                   |      |                                            |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                        |      |                                            |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 66                                                                                                                             |      |                                            |     |     |     |
| A                                                                                                                                                                                                    | B    | C                                          | D   | E   | FX  |
| 87,88                                                                                                                                                                                                | 6,06 | 6,06                                       | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                   |      |                                            |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                       |      |                                            |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                 |      |                                            |     |     |     |

## STATE EXAM DESCRIPTION

|                                                                 |                                                |
|-----------------------------------------------------------------|------------------------------------------------|
| <b>University:</b> Comenius University in Bratislava            |                                                |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics |                                                |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-991/16                     | <b>Course title:</b><br>Diploma Thesis Defense |
| <b>Number of credits:</b> 16                                    |                                                |
| <b>Educational level:</b> II.                                   |                                                |
| <b>State exam syllabus:</b>                                     |                                                |
| <b>Last change:</b>                                             |                                                |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.            |                                                |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                    |     |                                                    |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                         |     |                                                    |     |     |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-920/00                                                                                                                                                                                                                                                                                                                                             |     | <b>Course title:</b><br>Diploma Thesis Seminar (1) |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> seminar<br><b>Number of hours:</b><br><b>per week:</b> 1 <b>per level/semester:</b> 14<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                      |     |                                                    |     |     |     |
| <b>Number of credits:</b> 1                                                                                                                                                                                                                                                                                                                                                             |     |                                                    |     |     |     |
| <b>Recommended semester:</b> 2.                                                                                                                                                                                                                                                                                                                                                         |     |                                                    |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                           |     |                                                    |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                   |     |                                                    |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                             |     |                                                    |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                               |     |                                                    |     |     |     |
| <b>Class syllabus:</b><br>The first public presentation of the diploma thesis, formulation of the aims of the diploma thesis and the chosen way of realisation. Concluding analysis of the seminar talk.<br>Methodical advancement at the preparation of the structure and duration of the given seminar thesis, the use of references and possible ways to obtain needed informations. |     |                                                    |     |     |     |
| <b>Recommended literature:</b><br>According to the given diploma thesis.                                                                                                                                                                                                                                                                                                                |     |                                                    |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                      |     |                                                    |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                           |     |                                                    |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 67                                                                                                                                                                                                                                                                                                                |     |                                                    |     |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                       | B   | C                                                  | D   | E   | FX  |
| 100,0                                                                                                                                                                                                                                                                                                                                                                                   | 0,0 | 0,0                                                | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                      |     |                                                    |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                          |     |                                                    |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                    |     |                                                    |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                |     |                                                    |     |      |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                     |     |                                                    |     |      |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-921/00                                                                                                                                                                                                                                                                         |     | <b>Course title:</b><br>Diploma Thesis Seminar (2) |     |      |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> seminar<br><b>Number of hours:</b><br><b>per week: 2 per level/semester: 28</b><br><b>Form of the course:</b> on-site learning                                                                                                                         |     |                                                    |     |      |     |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                                                                                         |     |                                                    |     |      |     |
| <b>Recommended semester:</b> 3.                                                                                                                                                                                                                                                                                     |     |                                                    |     |      |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                       |     |                                                    |     |      |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                               |     |                                                    |     |      |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                         |     |                                                    |     |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                           |     |                                                    |     |      |     |
| <b>Class syllabus:</b><br>Common principles how to write a scientific particle, particularly a diploma thesis. Graifcal arrangement, segmentation, correct use of references etc. Seminar talk in a given time-frame, the use of different techniques at presentation. Concluding evaluation of the presented talk. |     |                                                    |     |      |     |
| <b>Recommended literature:</b><br>According to the given diploma thesis.                                                                                                                                                                                                                                            |     |                                                    |     |      |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                  |     |                                                    |     |      |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                       |     |                                                    |     |      |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 67                                                                                                                                                                                                                                            |     |                                                    |     |      |     |
| A                                                                                                                                                                                                                                                                                                                   | B   | C                                                  | D   | E    | FX  |
| 98,51                                                                                                                                                                                                                                                                                                               | 0,0 | 0,0                                                | 0,0 | 1,49 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                  |     |                                                    |     |      |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                      |     |                                                    |     |      |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                |     |                                                    |     |      |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                                    |     |      |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                  |     |                                                    |     |      |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-922/00                                                                                                                                                                                                                                                                                                                                                                                                                                      |     | <b>Course title:</b><br>Diploma Thesis Seminar (3) |     |      |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> seminar<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                               |     |                                                    |     |      |     |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |                                                    |     |      |     |
| <b>Recommended semester:</b> 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |                                                    |     |      |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                    |     |      |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                                                    |     |      |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |                                                    |     |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |                                                    |     |      |     |
| <b>Class syllabus:</b><br>To prepare the diploma thesis in the form, which is commonly used for this type of scientific publications. Analyses of the diploma thesis presentation, recommendations for eventual corrections, modifications and structure of the text, figure and table insertion and conformity with the text etc.<br>Common principles and recommendations to present the diploma thesis at the session of the examination committee in 15 – 20 min time limit. |     |                                                    |     |      |     |
| <b>Recommended literature:</b><br>The given diploma thesis.                                                                                                                                                                                                                                                                                                                                                                                                                      |     |                                                    |     |      |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                                    |     |      |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                    |     |      |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 66                                                                                                                                                                                                                                                                                                                                                                                                         |     |                                                    |     |      |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | B   | C                                                  | D   | E    | FX  |
| 98,48                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0,0 | 0,0                                                | 0,0 | 1,52 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                                    |     |      |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |                                                    |     |      |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                                    |     |      |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                     |      |                                                     |      |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                          |      |                                                     |      |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-103/15                                                                                                                                                                              |      | <b>Course title:</b><br>Elementary Particle Physics |      |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture / practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 / 1 <b>per level/semester:</b> 28 / 14<br><b>Form of the course:</b> on-site learning |      |                                                     |      |     |     |
| <b>Number of credits:</b> 4                                                                                                                                                                                              |      |                                                     |      |     |     |
| <b>Recommended semester:</b> 2.                                                                                                                                                                                          |      |                                                     |      |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                            |      |                                                     |      |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                    |      |                                                     |      |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                              |      |                                                     |      |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                |      |                                                     |      |     |     |
| <b>Class syllabus:</b>                                                                                                                                                                                                   |      |                                                     |      |     |     |
| <b>Recommended literature:</b>                                                                                                                                                                                           |      |                                                     |      |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                       |      |                                                     |      |     |     |
| <b>Notes:</b>                                                                                                                                                                                                            |      |                                                     |      |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 20                                                                                                                                                 |      |                                                     |      |     |     |
| A                                                                                                                                                                                                                        | B    | C                                                   | D    | E   | FX  |
| 50,0                                                                                                                                                                                                                     | 30,0 | 10,0                                                | 10,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Jozef Masarik, DrSc., Mgr. Pavol Bartoš, PhD.                                                                                                                                              |      |                                                     |      |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                           |      |                                                     |      |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                     |      |                                                     |      |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                  |       |                                                         |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                       |       |                                                         |      |      |      |
| <b>Course ID:</b><br>FMFI.KJP/1-MXX-233/13                                                                                                                                                                                                                                                            |       | <b>Course title:</b><br>English Conversation Course (1) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                 |       |                                                         |      |      |      |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                                                                           |       |                                                         |      |      |      |
| <b>Recommended semester:</b> 1., 3.                                                                                                                                                                                                                                                                   |       |                                                         |      |      |      |
| <b>Educational level:</b> I., II.                                                                                                                                                                                                                                                                     |       |                                                         |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                 |       |                                                         |      |      |      |
| <b>Course requirements:</b><br>Scale of assessment (preliminary/final): 100/0                                                                                                                                                                                                                         |       |                                                         |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                             |       |                                                         |      |      |      |
| <b>Class syllabus:</b><br>The content of the course is general English.<br>The language level is B2/C1 (Upper-Intermediate/Lower Advanced).                                                                                                                                                           |       |                                                         |      |      |      |
| <b>Recommended literature:</b><br>Selection of materials from Inside Out Upper-Intermediate, Cutting Edge Upper-Intermediate, New English File Upper-Intermediate, British and American newspapers and journals<br>Recordings: authentic and semi-authentic (source: BBC, CNN, coursebook recordings) |       |                                                         |      |      |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                    |       |                                                         |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                         |       |                                                         |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 144                                                                                                                                                                                                                             |       |                                                         |      |      |      |
| A                                                                                                                                                                                                                                                                                                     | B     | C                                                       | D    | E    | FX   |
| 59,72                                                                                                                                                                                                                                                                                                 | 18,06 | 9,03                                                    | 2,08 | 1,39 | 9,72 |
| <b>Lecturers:</b> PhDr. Elena Klátiková                                                                                                                                                                                                                                                               |       |                                                         |      |      |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                        |       |                                                         |      |      |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                  |       |                                                         |      |      |      |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                  |       |                                                         |      |     |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                       |       |                                                         |      |     |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-234/13                                                                                                                                                                                                                                                            |       | <b>Course title:</b><br>English Conversation Course (2) |      |     |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                 |       |                                                         |      |     |      |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                                                                           |       |                                                         |      |     |      |
| <b>Recommended semester:</b> 2., 4.                                                                                                                                                                                                                                                                   |       |                                                         |      |     |      |
| <b>Educational level:</b> I., II.                                                                                                                                                                                                                                                                     |       |                                                         |      |     |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                 |       |                                                         |      |     |      |
| <b>Course requirements:</b><br>Scale of assessment (preliminary/final): 100/0                                                                                                                                                                                                                         |       |                                                         |      |     |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                             |       |                                                         |      |     |      |
| <b>Class syllabus:</b><br>The course is a follow-up to the Conversation Course in English (1). The content of the course is general English.<br>The language level is B2/C1 (Upper-Intermediate/Lower Advanced).                                                                                      |       |                                                         |      |     |      |
| <b>Recommended literature:</b><br>Selection of materials from Inside Out Upper-Intermediate, Cutting Edge Upper-Intermediate, New English File Upper-Intermediate, British and American newspapers and journals<br>Recordings: authentic and semi-authentic (source: BBC, CNN, coursebook recordings) |       |                                                         |      |     |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                    |       |                                                         |      |     |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                         |       |                                                         |      |     |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 78                                                                                                                                                                                                                              |       |                                                         |      |     |      |
| A                                                                                                                                                                                                                                                                                                     | B     | C                                                       | D    | E   | FX   |
| 64,1                                                                                                                                                                                                                                                                                                  | 20,51 | 6,41                                                    | 1,28 | 0,0 | 7,69 |
| <b>Lecturers:</b> PhDr. Elena Klátiková                                                                                                                                                                                                                                                               |       |                                                         |      |     |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                        |       |                                                         |      |     |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                  |       |                                                         |      |     |      |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                               |       |                                                                     |       |       |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                    |       |                                                                     |       |       |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-114/15                                                                                                                                                        |       | <b>Course title:</b><br>Experimental Methods in Nuclear Physics (1) |       |       |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 4 <b>per level/semester:</b> 56<br><b>Form of the course:</b> on-site learning |       |                                                                     |       |       |     |
| <b>Number of credits:</b> 6                                                                                                                                                                        |       |                                                                     |       |       |     |
| <b>Recommended semester:</b> 1.                                                                                                                                                                    |       |                                                                     |       |       |     |
| <b>Educational level:</b> II.                                                                                                                                                                      |       |                                                                     |       |       |     |
| <b>Prerequisites:</b>                                                                                                                                                                              |       |                                                                     |       |       |     |
| <b>Course requirements:</b>                                                                                                                                                                        |       |                                                                     |       |       |     |
| <b>Learning outcomes:</b>                                                                                                                                                                          |       |                                                                     |       |       |     |
| <b>Class syllabus:</b>                                                                                                                                                                             |       |                                                                     |       |       |     |
| <b>Recommended literature:</b>                                                                                                                                                                     |       |                                                                     |       |       |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                 |       |                                                                     |       |       |     |
| <b>Notes:</b>                                                                                                                                                                                      |       |                                                                     |       |       |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 26                                                                                                                           |       |                                                                     |       |       |     |
| A                                                                                                                                                                                                  | B     | C                                                                   | D     | E     | FX  |
| 30,77                                                                                                                                                                                              | 11,54 | 30,77                                                               | 15,38 | 11,54 | 0,0 |
| <b>Lecturers:</b> doc. RNDr. Ivan Sýkora, PhD.                                                                                                                                                     |       |                                                                     |       |       |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                     |       |                                                                     |       |       |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                               |       |                                                                     |       |       |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |                                                                     |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                                                                     |       |      |      |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-105/00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      | <b>Course title:</b><br>Experimental Methods in Nuclear Physics (2) |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |                                                                     |       |      |      |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                                                                     |       |      |      |
| <b>Recommended semester:</b> 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                                                                     |       |      |      |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                                                                     |       |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |                                                                     |       |      |      |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                                                                     |       |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                                                     |       |      |      |
| <b>Class syllabus:</b><br>Specifics of the nuclear physics measurements, the base structure of the measuring equipment, the detector response function, energy resolution (limits, Fano factor), time characteristics (pile-up, the spectrum distortion). Magnetic methods of spectrometry, using magnetic field to separation of particle beam, the magnetic field focustion, the classification of the spectrometers. Ionization methods of charge particles spectrometry, ionization chamber with grid, principles of using the proportional counters, semiconductors detectors in the spectrometry, detectors with compensation and HPGe detectors. Scintillation spectrometry methods, treating of instrumental spectra, peak efficiency, multiple detectors gamma-ray spectrometry. The high resolution spectrometer electronic circuits scheme. The liquid scintillation spectrometry applications (3H a 14C analysis). Applications scintillations methods in radionuclide diagnostics (gammagraphic methods and PET, principles of imaging using the thin scintillator) |      |                                                                     |       |      |      |
| <b>Recommended literature:</b><br>Usačev S., a kol.: Experimentálna jadrová fyzika, ALFA Bratislava, 1982<br>Abramov A. I.: Osnovy experimentalnykh metodov jadernoj fiziky, Atmizdat Moskva 1980<br>W.R. Leo, Techniques for nuclear and particle physics, Springer Verlag, Berlin, 1996<br>K. Debertin and R.G. Helmer: Gamma-and X-ray spectrometry with semiconductor detctors, North-Holland, Amsterdam, 1988                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |                                                                     |       |      |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |                                                                     |       |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                                                                     |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                                                     |       |      |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | B    | C                                                                   | D     | E    | FX   |
| 34,29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 20,0 | 22,86                                                               | 17,14 | 4,29 | 1,43 |
| <b>Lecturers:</b> RNDr. Miroslav Pikna, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                                                                     |       |      |      |

|                                                      |
|------------------------------------------------------|
| <b>Last change:</b> 02.06.2015                       |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc. |

## STATE EXAM DESCRIPTION

|                                                                 |                                                                                |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------|
| <b>University:</b> Comenius University in Bratislava            |                                                                                |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics |                                                                                |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-956/15                     | <b>Course title:</b><br>Experimental Methods in Nuclear and Subnuclear Physics |
| <b>Number of credits:</b> 2                                     |                                                                                |
| <b>Educational level:</b> II.                                   |                                                                                |
| <b>State exam syllabus:</b>                                     |                                                                                |
| <b>Last change:</b> 02.06.2015                                  |                                                                                |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.            |                                                                                |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                         |      |                                          |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                              |      |                                          |     |     |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-136/00                                                                                                                                                                                                                                                  |      | <b>Course title:</b><br>Feynman Diagrams |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                           |      |                                          |     |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                  |      |                                          |     |     |     |
| <b>Recommended semester:</b> 2.                                                                                                                                                                                                                                                              |      |                                          |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                |      |                                          |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                        |      |                                          |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                  |      |                                          |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                    |      |                                          |     |     |     |
| <b>Class syllabus:</b><br>Particle scattering on potential in quantum mechanics, relativistic equations and their propagators, scattering of electron and positon on potential field, intercatons of electrons, muons and photons, second approach to Feynman diagram – quntum field theory. |      |                                          |     |     |     |
| <b>Recommended literature:</b><br>J. Pišút, Introduction to Feynam diagrams, Study texts UK Bratislava, (1984) (in Slovak)<br>J.D. Bjorken, S.D. Drell, Relativistic quantum mechanics, McGraw-Hill, New York, (1976)                                                                        |      |                                          |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                           |      |                                          |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                |      |                                          |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 32                                                                                                                                                                                                                     |      |                                          |     |     |     |
| A                                                                                                                                                                                                                                                                                            | B    | C                                        | D   | E   | FX  |
| 87,5                                                                                                                                                                                                                                                                                         | 12,5 | 0,0                                      | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Jozef Masarik, DrSc., prof. Ing. Ivan Hubáč, DrSc.                                                                                                                                                                                                             |      |                                          |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                               |      |                                          |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                         |      |                                          |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                  |       |                                             |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                       |       |                                             |      |      |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-141/00                                                                                                                                                                                                                            |       | <b>Course title:</b><br>French Language (1) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                 |       |                                             |      |      |      |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                                           |       |                                             |      |      |      |
| <b>Recommended semester:</b> 1.                                                                                                                                                                                                                                       |       |                                             |      |      |      |
| <b>Educational level:</b> I., II.                                                                                                                                                                                                                                     |       |                                             |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                 |       |                                             |      |      |      |
| <b>Course requirements:</b>                                                                                                                                                                                                                                           |       |                                             |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                             |       |                                             |      |      |      |
| <b>Class syllabus:</b><br>French language is taught at two levels: beginner and intermediate. Students opt for one of them depending on whether they wish to obtain the fundamentals of the language or wish to maintain and/or improve previous knowledge of French. |       |                                             |      |      |      |
| <b>Recommended literature:</b><br>Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2                                                                                                                               |       |                                             |      |      |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                    |       |                                             |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                         |       |                                             |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 387                                                                                                                                                                                             |       |                                             |      |      |      |
| A                                                                                                                                                                                                                                                                     | B     | C                                           | D    | E    | FX   |
| 41,09                                                                                                                                                                                                                                                                 | 21,96 | 21,19                                       | 9,82 | 2,07 | 3,88 |
| <b>Lecturers:</b> Mgr. Ľubomíra Kožehubová                                                                                                                                                                                                                            |       |                                             |      |      |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                        |       |                                             |      |      |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                  |       |                                             |      |      |      |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                |       |                                             |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                     |       |                                             |       |      |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-142/00                                                                                                                                                                                                                                                                          |       | <b>Course title:</b><br>French Language (2) |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week: 2 per level/semester: 28</b><br><b>Form of the course:</b> on-site learning                                                                                                                      |       |                                             |       |      |      |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                                                                                         |       |                                             |       |      |      |
| <b>Recommended semester:</b> 2.                                                                                                                                                                                                                                                                                     |       |                                             |       |      |      |
| <b>Educational level:</b> I., II.                                                                                                                                                                                                                                                                                   |       |                                             |       |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                               |       |                                             |       |      |      |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                         |       |                                             |       |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                           |       |                                             |       |      |      |
| <b>Class syllabus:</b><br>The subject continues the program of French language (1) and provides courses of essential and intermediate French language.                                                                                                                                                              |       |                                             |       |      |      |
| <b>Recommended literature:</b><br>Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2<br>Blažena Srncová: Učebnica francúzštiny pre študentov Matematicko-fyzikálnej fakulty , UK 1983<br>Kolektív Lingea, s.r.o.: Slovensko-francúzsky hovorník, Bratislava 2008 |       |                                             |       |      |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                  |       |                                             |       |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                       |       |                                             |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 247                                                                                                                                                                                                                                           |       |                                             |       |      |      |
| A                                                                                                                                                                                                                                                                                                                   | B     | C                                           | D     | E    | FX   |
| 36,03                                                                                                                                                                                                                                                                                                               | 26,72 | 21,05                                       | 10,93 | 2,83 | 2,43 |
| <b>Lecturers:</b> Mgr. Ľubomíra Kožehubová                                                                                                                                                                                                                                                                          |       |                                             |       |      |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                      |       |                                             |       |      |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                |       |                                             |       |      |      |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                |       |                                             |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                     |       |                                             |      |      |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-241/00                                                                                                                                                                                                                                                                          |       | <b>Course title:</b><br>French Language (3) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week: 2 per level/semester: 28</b><br><b>Form of the course:</b> on-site learning                                                                                                                      |       |                                             |      |      |      |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                                                                                         |       |                                             |      |      |      |
| <b>Recommended semester:</b> 3.                                                                                                                                                                                                                                                                                     |       |                                             |      |      |      |
| <b>Educational level:</b> I., II.                                                                                                                                                                                                                                                                                   |       |                                             |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                               |       |                                             |      |      |      |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                         |       |                                             |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                           |       |                                             |      |      |      |
| <b>Class syllabus:</b><br>The subject provides a course of intermediate French language, covering not only general, but also technical language.                                                                                                                                                                    |       |                                             |      |      |      |
| <b>Recommended literature:</b><br>Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2<br>Blažena Srncová: Učebnica francúzštiny pre študentov Matematicko-fyzikálnej fakulty , UK 1983<br>Kolektív Lingea, s.r.o.: Slovensko-francúzsky hovorník, Bratislava 2008 |       |                                             |      |      |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                  |       |                                             |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                       |       |                                             |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 97                                                                                                                                                                                                                                            |       |                                             |      |      |      |
| A                                                                                                                                                                                                                                                                                                                   | B     | C                                           | D    | E    | FX   |
| 36,08                                                                                                                                                                                                                                                                                                               | 28,87 | 22,68                                       | 7,22 | 1,03 | 4,12 |
| <b>Lecturers:</b> Mgr. Ľubomíra Kožehubová                                                                                                                                                                                                                                                                          |       |                                             |      |      |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                      |       |                                             |      |      |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                |       |                                             |      |      |      |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                       |       |                                             |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                            |       |                                             |      |      |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-242/00                                                                                                                                                                                                                                                                                                                                                                 |       | <b>Course title:</b><br>French Language (4) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                      |       |                                             |      |      |      |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                |       |                                             |      |      |      |
| <b>Recommended semester:</b> 4.                                                                                                                                                                                                                                                                                                                                                                            |       |                                             |      |      |      |
| <b>Educational level:</b> I., II.                                                                                                                                                                                                                                                                                                                                                                          |       |                                             |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                      |       |                                             |      |      |      |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                |       |                                             |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                  |       |                                             |      |      |      |
| <b>Class syllabus:</b><br>The subject provides a course of intermediate French covering not only general, but also technical French language.                                                                                                                                                                                                                                                              |       |                                             |      |      |      |
| <b>Recommended literature:</b><br>Pravda, Pravdová: Učebnica francúzštiny pre samoukov a kurzy, SPN Bratislava 1999, ISBN 80-08-00431-2<br>Blažena Srncová: Učebnica francúzštiny pre študentov Matematicko-fyzikálnej fakulty , UK 1983<br>Kolektív Lingea, s.r.o.: Slovensko-francúzsky hovorník, Bratislava 2008<br>Zarha Lahmidi: Sciences-techniques.com, ISBN 209-0331186-0, CLE international, 2005 |       |                                             |      |      |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                         |       |                                             |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                              |       |                                             |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 68                                                                                                                                                                                                                                                                                                                                   |       |                                             |      |      |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                          | B     | C                                           | D    | E    | FX   |
| 36,76                                                                                                                                                                                                                                                                                                                                                                                                      | 35,29 | 19,12                                       | 2,94 | 1,47 | 4,41 |
| <b>Lecturers:</b> Mgr. Ľubomíra Kožehubová                                                                                                                                                                                                                                                                                                                                                                 |       |                                             |      |      |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                             |       |                                             |      |      |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                       |       |                                             |      |      |      |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                 |       |                                             |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                      |       |                                             |      |      |      |
| <b>Course ID:</b><br>FMFI.KJP/1-MXX-151/00                                                                                                                                                                                                           |       | <b>Course title:</b><br>German Language (1) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week: 2 per level/semester: 28</b><br><b>Form of the course:</b> on-site learning                                                       |       |                                             |      |      |      |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                          |       |                                             |      |      |      |
| <b>Recommended semester:</b> 1.                                                                                                                                                                                                                      |       |                                             |      |      |      |
| <b>Educational level:</b> I., II.                                                                                                                                                                                                                    |       |                                             |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                |       |                                             |      |      |      |
| <b>Course requirements:</b>                                                                                                                                                                                                                          |       |                                             |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                            |       |                                             |      |      |      |
| <b>Class syllabus:</b><br>German language is taught at three levels: beginner, intermediate and advanced. Students opt for one of them depending on whether they need to learn the fundamentals or maintain and/or improve their previous knowledge. |       |                                             |      |      |      |
| <b>Recommended literature:</b><br>Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.                                                                                                                         |       |                                             |      |      |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                   |       |                                             |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                        |       |                                             |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 666                                                                                                                                                                            |       |                                             |      |      |      |
| A                                                                                                                                                                                                                                                    | B     | C                                           | D    | E    | FX   |
| 32,28                                                                                                                                                                                                                                                | 29,13 | 21,17                                       | 9,91 | 2,85 | 4,65 |
| <b>Lecturers:</b> Mgr. Alexandra Maďarová, Mgr. Marián Mancovič                                                                                                                                                                                      |       |                                             |      |      |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                       |       |                                             |      |      |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                 |       |                                             |      |      |      |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                  |       |                                             |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                       |       |                                             |       |      |      |
| <b>Course ID:</b><br>FMFI.KJP/1-MXX-152/00                                                                                                                                                            |       | <b>Course title:</b><br>German Language (2) |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |       |                                             |       |      |      |
| <b>Number of credits:</b> 2                                                                                                                                                                           |       |                                             |       |      |      |
| <b>Recommended semester:</b> 2.                                                                                                                                                                       |       |                                             |       |      |      |
| <b>Educational level:</b> I., II.                                                                                                                                                                     |       |                                             |       |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                 |       |                                             |       |      |      |
| <b>Course requirements:</b>                                                                                                                                                                           |       |                                             |       |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                             |       |                                             |       |      |      |
| <b>Class syllabus:</b><br>The course continues the program of German language (1). German language is taught at three levels: beginner, intermediate, advanced.                                       |       |                                             |       |      |      |
| <b>Recommended literature:</b><br>Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.                                                                          |       |                                             |       |      |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                    |       |                                             |       |      |      |
| <b>Notes:</b>                                                                                                                                                                                         |       |                                             |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 423                                                                                                                             |       |                                             |       |      |      |
| A                                                                                                                                                                                                     | B     | C                                           | D     | E    | FX   |
| 30,5                                                                                                                                                                                                  | 21,99 | 22,93                                       | 14,66 | 3,78 | 6,15 |
| <b>Lecturers:</b> Mgr. Alexandra Maďarová, Mgr. Marián Mancovič                                                                                                                                       |       |                                             |       |      |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                        |       |                                             |       |      |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                  |       |                                             |       |      |      |

## COURSE DESCRIPTION

|                                                                                                                                                                                                                                  |      |                                             |      |      |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------------------------------------|------|------|------|
| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                             |      |                                             |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                  |      |                                             |      |      |      |
| <b>Course ID:</b><br>FMFI.KJP/1-MXX-251/00                                                                                                                                                                                       |      | <b>Course title:</b><br>German Language (3) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                            |      |                                             |      |      |      |
| <b>Number of credits:</b> 2                                                                                                                                                                                                      |      |                                             |      |      |      |
| <b>Recommended semester:</b> 3.                                                                                                                                                                                                  |      |                                             |      |      |      |
| <b>Educational level:</b> I., II.                                                                                                                                                                                                |      |                                             |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                            |      |                                             |      |      |      |
| <b>Course requirements:</b>                                                                                                                                                                                                      |      |                                             |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                        |      |                                             |      |      |      |
| <b>Class syllabus:</b><br>The subject continues the program of German language (2). It provides a course of intermediate and advanced German language.                                                                           |      |                                             |      |      |      |
| <b>Recommended literature:</b><br>Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.<br>Aus moderner Technik und Naturwissenschaft, 1999, Max Hueber Verlag, D-85737, ISBN 3-19-001629-1 |      |                                             |      |      |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                               |      |                                             |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                    |      |                                             |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 150                                                                                                                                                        |      |                                             |      |      |      |
| A                                                                                                                                                                                                                                | B    | C                                           | D    | E    | FX   |
| 38,0                                                                                                                                                                                                                             | 28,0 | 22,0                                        | 6,67 | 2,67 | 2,67 |
| <b>Lecturers:</b> Mgr. Alexandra Maďarová, Mgr. Marián Mancovič                                                                                                                                                                  |      |                                             |      |      |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                   |      |                                             |      |      |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                             |      |                                             |      |      |      |

## COURSE DESCRIPTION

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------------------------------------|-------|------|------|
| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                              |       |                                             |       |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                   |       |                                             |       |      |      |
| <b>Course ID:</b><br>FMFI.KJP/1-MXX-252/00                                                                                                                                                                                                                        |       | <b>Course title:</b><br>German Language (4) |       |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                             |       |                                             |       |      |      |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                                       |       |                                             |       |      |      |
| <b>Recommended semester:</b> 4.                                                                                                                                                                                                                                   |       |                                             |       |      |      |
| <b>Educational level:</b> I., II.                                                                                                                                                                                                                                 |       |                                             |       |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                             |       |                                             |       |      |      |
| <b>Course requirements:</b>                                                                                                                                                                                                                                       |       |                                             |       |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                         |       |                                             |       |      |      |
| <b>Class syllabus:</b><br>The subject continues the program of German language (3). It provides a course of intermediate and advanced German language.                                                                                                            |       |                                             |       |      |      |
| <b>Recommended literature:</b><br>Vilášek, P.: Nemčina pre študentov FMFI, Na webovej stránke autora v elektronickej podobe.<br>Vilma Václavíková: Nemčina pre študentov MFF UK, Vysokoškolský učebný text pre potrebu študentov KJP, č. 9793/1982 C VIII/2, 1983 |       |                                             |       |      |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                |       |                                             |       |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                     |       |                                             |       |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 78                                                                                                                                                                                          |       |                                             |       |      |      |
| A                                                                                                                                                                                                                                                                 | B     | C                                           | D     | E    | FX   |
| 35,9                                                                                                                                                                                                                                                              | 28,21 | 14,1                                        | 12,82 | 3,85 | 5,13 |
| <b>Lecturers:</b> Mgr. Alexandra Maďarová, Mgr. Marián Mancovič                                                                                                                                                                                                   |       |                                             |       |      |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                    |       |                                             |       |      |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                              |       |                                             |       |      |      |

## COURSE DESCRIPTION

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------------------------------------|-------|-------|-----|
| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                     |       |                                             |       |       |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                          |       |                                             |       |       |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-222/15                                                                                                                                                                              |       | <b>Course title:</b><br>High Energy Physics |       |       |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture / practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 / 1 <b>per level/semester:</b> 28 / 14<br><b>Form of the course:</b> on-site learning |       |                                             |       |       |     |
| <b>Number of credits:</b> 4                                                                                                                                                                                              |       |                                             |       |       |     |
| <b>Recommended semester:</b> 3.                                                                                                                                                                                          |       |                                             |       |       |     |
| <b>Educational level:</b> II.                                                                                                                                                                                            |       |                                             |       |       |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                    |       |                                             |       |       |     |
| <b>Course requirements:</b>                                                                                                                                                                                              |       |                                             |       |       |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                |       |                                             |       |       |     |
| <b>Class syllabus:</b>                                                                                                                                                                                                   |       |                                             |       |       |     |
| <b>Recommended literature:</b>                                                                                                                                                                                           |       |                                             |       |       |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                       |       |                                             |       |       |     |
| <b>Notes:</b>                                                                                                                                                                                                            |       |                                             |       |       |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 21                                                                                                                                                 |       |                                             |       |       |     |
| A                                                                                                                                                                                                                        | B     | C                                           | D     | E     | FX  |
| 19,05                                                                                                                                                                                                                    | 23,81 | 23,81                                       | 19,05 | 14,29 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Stanislav Tokár, DrSc., Mgr. Pavol Bartoš, PhD.                                                                                                                                            |       |                                             |       |       |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                           |       |                                             |       |       |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                     |       |                                             |       |       |     |

## COURSE DESCRIPTION

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------|-----|------|-----|
| <b>University:</b> Comenius University in Bratislava                                                                                                                                               |     |                                                              |     |      |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                    |     |                                                              |     |      |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-142/15                                                                                                                                                        |     | <b>Course title:</b><br>Methods in Nuclear Structure Studies |     |      |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |     |                                                              |     |      |     |
| <b>Number of credits:</b> 3                                                                                                                                                                        |     |                                                              |     |      |     |
| <b>Recommended semester:</b> 2.                                                                                                                                                                    |     |                                                              |     |      |     |
| <b>Educational level:</b> II.                                                                                                                                                                      |     |                                                              |     |      |     |
| <b>Prerequisites:</b>                                                                                                                                                                              |     |                                                              |     |      |     |
| <b>Course requirements:</b>                                                                                                                                                                        |     |                                                              |     |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                                          |     |                                                              |     |      |     |
| <b>Class syllabus:</b>                                                                                                                                                                             |     |                                                              |     |      |     |
| <b>Recommended literature:</b>                                                                                                                                                                     |     |                                                              |     |      |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                 |     |                                                              |     |      |     |
| <b>Notes:</b>                                                                                                                                                                                      |     |                                                              |     |      |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 20                                                                                                                           |     |                                                              |     |      |     |
| A                                                                                                                                                                                                  | B   | C                                                            | D   | E    | FX  |
| 70,0                                                                                                                                                                                               | 5,0 | 10,0                                                         | 5,0 | 10,0 | 0,0 |
| <b>Lecturers:</b> doc. Mgr. Stanislav Antalic, PhD.                                                                                                                                                |     |                                                              |     |      |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                     |     |                                                              |     |      |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                               |     |                                                              |     |      |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |                                                        |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                                                        |     |     |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-125/00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      | <b>Course title:</b><br>Modelling Experimental Set-Ups |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |                                                        |     |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                                        |     |     |     |
| <b>Recommended semester:</b> 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                                                        |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                                                        |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |                                                        |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                                        |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                                        |     |     |     |
| <b>Class syllabus:</b><br>Basic terms of the probability theory and mathematical statistics. Important distributions. General scheme of Monte Carlo methods. Sampling of distribution functions. Specific methods for sampling of irregular distributions. Stochastic processes. Imitation of physical process. Structure of transport equation for hadronic and elektromagnetic cascade. Solution of transport equation using Monte Carlo. Basic scheme of GEANT package. Definition of materials, medii, geometry of experiment. Volume, subvolume and their positioning. Detector response. Storing of information in data structure. Simulated physical processes and their control. Passage of particle through volume, detector and set. GEANT data struktures. Graphics. Interactive GEANT. |      |                                                        |     |     |     |
| <b>Recommended literature:</b><br>A. Rényi, Teorie pravdepodobnosti, ACADEMIA, Praha 1972<br>J. Spanier, E.M. Gebard, Monte Carlo principles and Neutron transport Problems, Edison Wesley Pub. Comp., Massachusets 1969.<br>S.M. Jermakov, Metod Monte Carlo i smezhnyje voprosy, Nauka Moskva 1975<br>R. Brun et al., GEANT-CERN Program Library D506                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |                                                        |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |                                                        |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                                                        |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |                                                        |     |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | B    | C                                                      | D   | E   | FX  |
| 90,48                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 4,76 | 4,76                                                   | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Stanislav Tokár, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |                                                        |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                                                        |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |                                                        |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                              |     |                                                                        |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                   |     |                                                                        |     |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-249/16                                                                                                                                                       |     | <b>Course title:</b><br>Modelling of Radiation Interaction with Matter |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> course<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |     |                                                                        |     |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                       |     |                                                                        |     |     |     |
| <b>Recommended semester:</b> 4.                                                                                                                                                                   |     |                                                                        |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                     |     |                                                                        |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                             |     |                                                                        |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                       |     |                                                                        |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                         |     |                                                                        |     |     |     |
| <b>Class syllabus:</b>                                                                                                                                                                            |     |                                                                        |     |     |     |
| <b>Recommended literature:</b>                                                                                                                                                                    |     |                                                                        |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                |     |                                                                        |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                     |     |                                                                        |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 1                                                                                                                           |     |                                                                        |     |     |     |
| A                                                                                                                                                                                                 | B   | C                                                                      | D   | E   | FX  |
| 100,0                                                                                                                                                                                             | 0,0 | 0,0                                                                    | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Stanislav Tokár, DrSc., RNDr. Tibor Ženiš, PhD., Mgr. Róbert Breier, PhD.                                                                                           |     |                                                                        |     |     |     |
| <b>Last change:</b> 12.04.2016                                                                                                                                                                    |     |                                                                        |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                              |     |                                                                        |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                               |     |                                                                          |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                    |     |                                                                          |     |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-244/16                                                                                                                                                        |     | <b>Course title:</b><br>Neutrino Physics and Week Interactions in Nuclei |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |     |                                                                          |     |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                        |     |                                                                          |     |     |     |
| <b>Recommended semester:</b> 4.                                                                                                                                                                    |     |                                                                          |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                      |     |                                                                          |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                              |     |                                                                          |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                        |     |                                                                          |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                          |     |                                                                          |     |     |     |
| <b>Class syllabus:</b>                                                                                                                                                                             |     |                                                                          |     |     |     |
| <b>Recommended literature:</b>                                                                                                                                                                     |     |                                                                          |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                 |     |                                                                          |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                      |     |                                                                          |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 1                                                                                                                            |     |                                                                          |     |     |     |
| A                                                                                                                                                                                                  | B   | C                                                                        | D   | E   | FX  |
| 100,0                                                                                                                                                                                              | 0,0 | 0,0                                                                      | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Fedor Šimkovic, CSc., Mgr. Dušan Štefánik, PhD.                                                                                                                      |     |                                                                          |     |     |     |
| <b>Last change:</b> 20.05.2016                                                                                                                                                                     |     |                                                                          |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                               |     |                                                                          |     |     |     |

## COURSE DESCRIPTION

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------------------------------------|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava                                                                                                                                               |       |                                                             |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                    |       |                                                             |     |     |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-221/15                                                                                                                                                        |       | <b>Course title:</b><br>Neutron Physics and Reactor Systems |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 3 <b>per level/semester:</b> 42<br><b>Form of the course:</b> on-site learning |       |                                                             |     |     |     |
| <b>Number of credits:</b> 4                                                                                                                                                                        |       |                                                             |     |     |     |
| <b>Recommended semester:</b> 3.                                                                                                                                                                    |       |                                                             |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                      |       |                                                             |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                              |       |                                                             |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                        |       |                                                             |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                          |       |                                                             |     |     |     |
| <b>Class syllabus:</b>                                                                                                                                                                             |       |                                                             |     |     |     |
| <b>Recommended literature:</b>                                                                                                                                                                     |       |                                                             |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                 |       |                                                             |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                      |       |                                                             |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 16                                                                                                                           |       |                                                             |     |     |     |
| A                                                                                                                                                                                                  | B     | C                                                           | D   | E   | FX  |
| 68,75                                                                                                                                                                                              | 18,75 | 12,5                                                        | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> doc. RNDr. Karol Holý, CSc., RNDr. Miroslav Ješkovský, PhD.                                                                                                                      |       |                                                             |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                     |       |                                                             |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                               |       |                                                             |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                             |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                             |      |      |      |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-122/00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       | <b>Course title:</b><br>Nuclear Electronics |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                                                                                                                           |       |                                             |      |      |      |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                             |      |      |      |
| <b>Recommended semester:</b> 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                             |      |      |      |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                             |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                             |      |      |      |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                             |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                             |      |      |      |
| <b>Class syllabus:</b><br>The lecture deals: with basic information about methods using in linear circuits analyses, about circuits with semiconductors elements (- transistors, operational amplifiers, fast pulse amplifiers, linear amplifier with low noise level), about others circuits useful in pulse high digitization techniques and in coincidence timing measurement (- Pulse shapers and amplitude discriminators, Methods to generate fast-time pick-off signal from input pulse, coincidence and anticoincidence circuits and automation of data processing). |       |                                             |      |      |      |
| <b>Recommended literature:</b><br>D.Kollár: Elektronika a automatizácia I. Textbook MFF UK 1990.<br>D.Kollár: Elektronika a automatizácia II. Textbook MFF UK 1990.<br>A. P. Citovič: Jadernaja elektronika, Energoatomizdat, Moskva 1984.<br>U. Tietze, Ch. Schenk: Halbleiter-schaltungstechnik, MIR, Moskva 1982.<br>J. Šeda, J. Sabol, J. Kubánek: Jaderná elektronika, SNTL, Praha 1977.<br>Comments to the lectures on web URL -- <a href="http://www.dnp.fmph.uniba.sk/~kollar/navodnik.htm">http://www.dnp.fmph.uniba.sk/~kollar/navodnik.htm</a> .                  |       |                                             |      |      |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                             |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                             |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 72                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                             |      |      |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | B     | C                                           | D    | E    | FX   |
| 37,5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 31,94 | 19,44                                       | 6,94 | 1,39 | 2,78 |
| <b>Lecturers:</b> RNDr. Tibor Ženiš, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                             |      |      |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                             |      |      |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                             |      |      |      |

## COURSE DESCRIPTION

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava                                                                                                                                               |     |                                            |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                    |     |                                            |     |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-133/15                                                                                                                                                        |     | <b>Course title:</b><br>Nuclear Energetics |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |     |                                            |     |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                        |     |                                            |     |     |     |
| <b>Recommended semester:</b> 4.                                                                                                                                                                    |     |                                            |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                      |     |                                            |     |     |     |
| <b>Prerequisites:</b> FMFI.KJFB/2-FJF-221/15 - Neutron Physics and Reactor Systems                                                                                                                 |     |                                            |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                        |     |                                            |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                          |     |                                            |     |     |     |
| <b>Class syllabus:</b>                                                                                                                                                                             |     |                                            |     |     |     |
| <b>Recommended literature:</b>                                                                                                                                                                     |     |                                            |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                 |     |                                            |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                      |     |                                            |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 6                                                                                                                            |     |                                            |     |     |     |
| A                                                                                                                                                                                                  | B   | C                                          | D   | E   | FX  |
| 83,33                                                                                                                                                                                              | 0,0 | 16,67                                      | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> RNDr. Alexander Šivo, PhD., Ing. Jakub Kaizer, PhD.                                                                                                                              |     |                                            |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                     |     |                                            |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                               |     |                                            |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                                             |      |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                        |       |                                                             |      |     |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-138/00                                                                                                                                                                                                                                                                                                                                                                                                            |       | <b>Course title:</b><br>Nuclear Geophysics and Astrophysics |      |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                     |       |                                                             |      |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                                             |      |     |     |
| <b>Recommended semester:</b> 2.                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                                             |      |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                             |      |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                                             |      |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                                             |      |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                             |      |     |     |
| <b>Class syllabus:</b><br>Basics theory of nucleosynthesis, primordial, antropogenic and cosmogenic nuclides. Principles of nuclear radiometric methods, dating, erosion study, 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. |       |                                                             |      |     |     |
| <b>Recommended literature:</b><br>W.S. Broecker, How to built a habitable planet, Eldigia press, Pallisades, (1988)<br>D. Lal and B. Peters, Handbuch der Physik, Springer-Verlag, (1967)                                                                                                                                                                                                                                                              |       |                                                             |      |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                             |      |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                             |      |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 34                                                                                                                                                                                                                                                                                                                                                                               |       |                                                             |      |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                      | B     | C                                                           | D    | E   | FX  |
| 64,71                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 26,47 | 2,94                                                        | 5,88 | 0,0 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                             |      |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                                             |      |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                                             |      |     |     |

## STATE EXAM DESCRIPTION

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|-----------------------------------------------------------------|-----------------------------------------|
| <b>University:</b> Comenius University in Bratislava            |                                         |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics |                                         |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-958/15                     | <b>Course title:</b><br>Nuclear Physics |
| <b>Number of credits:</b> 2                                     |                                         |
| <b>Educational level:</b> II.                                   |                                         |
| <b>State exam syllabus:</b>                                     |                                         |
| <b>Last change:</b> 02.06.2015                                  |                                         |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.            |                                         |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                           |      |      |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                           |      |      |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-202/00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       | <b>Course title:</b><br>Nuclear Reactions |      |      |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                                                                                                          |       |                                           |      |      |     |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                           |      |      |     |
| <b>Recommended semester:</b> 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                           |      |      |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                           |      |      |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                           |      |      |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                           |      |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                           |      |      |     |
| <b>Class syllabus:</b><br>General principles of nuclear reactions (NRs), reaction kinematics, the role of orbital momentum, rotational potential, types of NRs, reaction cross section, elastic and inelastic scattering, neutron induced NRs, nucleon transfer reactions, deep inelastic reactions, reactions of $\gamma$ -quant, compound nucleus reactions, heavy ion reactions, fission reactions, thermonuclear reactions, synthesis of superheavy nuclei, nuclear reactions at relativistic energies, applications of NRs, experimental basis of NRs. |       |                                           |      |      |     |
| <b>Recommended literature:</b><br>Full text of the subject manuscript in MS Words and hardcopy.<br>Recommended additional reading: P.E. Hodgson, e. Gadioli, E. Gadioli Erba, Introductory Nuclear Physics, Oxford U.P. 2000.                                                                                                                                                                                                                                                                                                                               |       |                                           |      |      |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                           |      |      |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                           |      |      |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                           |      |      |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | B     | C                                         | D    | E    | FX  |
| 47,14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 25,71 | 18,57                                     | 7,14 | 1,43 | 0,0 |
| <b>Lecturers:</b> doc. Mgr. Stanislav Antalic, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                           |      |      |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                           |      |      |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                           |      |      |     |

## STATE EXAM DESCRIPTION

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|-----------------------------------------------------------------|--------------------------------------------------------|
| <b>University:</b> Comenius University in Bratislava            |                                                        |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics |                                                        |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-955/15                     | <b>Course title:</b><br>Nuclear and Subnuclear Physics |
| <b>Number of credits:</b> 2                                     |                                                        |
| <b>Educational level:</b> II.                                   |                                                        |
| <b>State exam syllabus:</b>                                     |                                                        |
| <b>Last change:</b> 02.06.2015                                  |                                                        |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.            |                                                        |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                        |      |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                        |      |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-107/00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       | <b>Course title:</b><br>Nucleus Theory |      |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                        |      |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                        |      |     |     |
| <b>Recommended semester:</b> 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                        |      |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                        |      |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                        |      |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                        |      |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                        |      |     |     |
| <b>Class syllabus:</b><br>History and success of nuclear physics, basic characteristics of nucleus (mass, dimension, spin, magnetic and electric moments, quadrupole moments, nuclear deformation), models of strong interacting particles (drop model, nuclear matter, nuclear stars), models of independent particles (Fermi model), nuclear shell model (harmonic oscillator potential, Woods-Saxon potential, spin-orbit interaction), generalized models<br>(single particle states in non-sphericals – Nilsson model, roational bands, vibrational states, resonances), optical model, Pauli exclusion principle and isospin, Nucleon-nucleon interaction, phase analysis of scattering angles, two-particle wave function, deuteron, nuclear Hamiltonian, microscopical models (Hartree and Hartree-Fock methods), nuclear interactions (alpha, beta and gamma nuclear transitions). |       |                                        |      |     |     |
| <b>Recommended literature:</b><br>T. Mayer-Kuckuk: Fyzika atómového jadra, SNTL, Praha, 1979,<br>J.M.Eisenberg, W.Greiner: Nuclear Theory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                        |      |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                        |      |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                        |      |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 66                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                        |      |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | B     | C                                      | D    | E   | FX  |
| 50,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 34,85 | 13,64                                  | 1,52 | 0,0 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Fedor Šimkovic, CSc., Mgr. Dušan Štefánik, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                        |      |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                        |      |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                        |      |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                     |      |                                                              |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                          |      |                                                              |     |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-124/00                                                                                                                                                                                                                                                                                                                                                                                              |      | <b>Course title:</b><br>Numerical Methods in Nuclear Physics |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                       |      |                                                              |     |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                              |      |                                                              |     |     |     |
| <b>Recommended semester:</b> 2.                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                                              |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                            |      |                                                              |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                                                              |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                              |      |                                                              |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                |      |                                                              |     |     |     |
| <b>Class syllabus:</b><br>Approximation by rational fuctions, approximation by trigionometric functions, solution of linear algebric equations, solution of nonlinear equations, interpolation and extrapolation, numerical integration, special functions (gamma, beta factorials), random numbers, minimization and maximization of functions. Error propagation. Fourier transformation. Ordinary and partial differential equations. |      |                                                              |     |     |     |
| <b>Recommended literature:</b><br>P.L. DeVries, A first course in computational physics, John Wiley, Miami (1984)<br>S.S.M. Wong, Compuational methods in physics and engineering, Prentice Hall, Englewwod Cliffs, (1992)<br>K. Langanke, J.A. Maruhn, S.E. Koonin, Computational nuclear physics 1,2, Springer/Verlag, New York, (1993)                                                                                                |      |                                                              |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                       |      |                                                              |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                            |      |                                                              |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 34                                                                                                                                                                                                                                                                                                                                                                 |      |                                                              |     |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                        | B    | C                                                            | D   | E   | FX  |
| 94,12                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5,88 | 0,0                                                          | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> RNDr. Ing. Milan Melicherčík, PhD.                                                                                                                                                                                                                                                                                                                                                                                     |      |                                                              |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                           |      |                                                              |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                     |      |                                                              |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                               |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                               |     |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-132/00                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       | <b>Course title:</b><br>Particle Accelerators |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                                                                       |       |                                               |     |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                               |     |     |     |
| <b>Recommended semester:</b> 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                               |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                               |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                               |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                               |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                               |     |     |     |
| <b>Class syllabus:</b><br>What for we need accelerators. Linear electrostatic accelerators. Linear resonance accelerators. Cyclic accelerators: cyclotron, fazotron, microtron, betatron, synchrotron, synchrofazotron. Strong focusation. Description of particle trajectories in the accelerator, stability condition. Extracted beams. Colliding beams. Accelerating and acumulating facilities. Colliders. Beam cooling techniques. Aplication of acceleators in different fields of science, medicine and industry. |       |                                               |     |     |     |
| <b>Recommended literature:</b><br>S.Usačev a kol. Experimentálna jadrová fyzika, SNTL, Bratislava, 1982<br>I.Úlehla, M.Suk, Z.Trka: Atomy, jadra, častice, Academie, Praha, 1990                                                                                                                                                                                                                                                                                                                                         |       |                                               |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                               |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                               |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 70                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                               |     |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | B     | C                                             | D   | E   | FX  |
| 55,71                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 31,43 | 12,86                                         | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> Mgr. Michal Mereš, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                               |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                               |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                               |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                 |      |                                                          |     |     |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                      |      |                                                          |     |     |      |
| <b>Course ID:</b><br>FMFI.KTV/2-MXX-110/00                                                                                                                                                                                                                                                                                                                                                           |      | <b>Course title:</b><br>Physical Education and Sport (1) |     |     |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                |      |                                                          |     |     |      |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                          |      |                                                          |     |     |      |
| <b>Recommended semester:</b> 1.                                                                                                                                                                                                                                                                                                                                                                      |      |                                                          |     |     |      |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                        |      |                                                          |     |     |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                |      |                                                          |     |     |      |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                          |      |                                                          |     |     |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                            |      |                                                          |     |     |      |
| <b>Class syllabus:</b><br>Practicing of the students' game skills in collective sports: basketball, volleyball, football, floorball and hockey. Mastering of the basic technique of a particular sport discipline in other sports. In paddling, basic training on still and slightly flowing water. Development of coordination skills, improvement of articular mobility and cardiovascular system. |      |                                                          |     |     |      |
| <b>Recommended literature:</b>                                                                                                                                                                                                                                                                                                                                                                       |      |                                                          |     |     |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                   |      |                                                          |     |     |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                        |      |                                                          |     |     |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 1433                                                                                                                                                                                                                                                                                                                           |      |                                                          |     |     |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                    | B    | C                                                        | D   | E   | FX   |
| 99,16                                                                                                                                                                                                                                                                                                                                                                                                | 0,56 | 0,0                                                      | 0,0 | 0,0 | 0,28 |
| <b>Lecturers:</b> PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický, Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek                                                                                                                                                          |      |                                                          |     |     |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                       |      |                                                          |     |     |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                 |      |                                                          |     |     |      |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |                                                          |      |     |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                                          |      |     |      |
| <b>Course ID:</b><br>FMFL.KTV/2-MXX-120/00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      | <b>Course title:</b><br>Physical Education and Sport (2) |      |     |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                                                                                                  |      |                                                          |      |     |      |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |                                                          |      |     |      |
| <b>Recommended semester:</b> 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                                          |      |     |      |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                                          |      |     |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                                                          |      |     |      |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |                                                          |      |     |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |                                                          |      |     |      |
| <b>Class syllabus:</b><br>Practicing of offensive and defensive game combinations and playing with modified rules in collective sports such as basketball, volleyball, football, floorball, hockey. Command of elements of higher difficulty in locomotion skills (swimming - crawl stroke, breast stroke, butterfly stroke, trampoline jumping and aerobics – practicing of areobics compositions, bodybuilding – development of the main muscle groups, paddling on running water. Testing of the level of physical fitness and coordination skills. |      |                                                          |      |     |      |
| <b>Recommended literature:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                                          |      |     |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                                                          |      |     |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                                          |      |     |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 1331                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |                                                          |      |     |      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | B    | C                                                        | D    | E   | FX   |
| 99,77                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0,08 | 0,0                                                      | 0,08 | 0,0 | 0,08 |
| <b>Lecturers:</b> Mgr. Martin Dovičák, PhD., Mgr. Tomáš Kuchár, PhD., Mgr. Jana Leginusová, PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Branislav Nedbálek, PaedDr. Mikuláš Ortutay, Mgr. Ondrej Podkonický, Mgr. Júlia Raábová, PhD.                                                                                                                                                                                                                                                                                                            |      |                                                          |      |     |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                                          |      |     |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |                                                          |      |     |      |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                               |      |                                                          |     |     |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                    |      |                                                          |     |     |      |
| <b>Course ID:</b><br>FMFL.KTV/2-MXX-210/00                                                                                                                                                                                                                                         |      | <b>Course title:</b><br>Physical Education and Sport (3) |     |     |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                              |      |                                                          |     |     |      |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                                                        |      |                                                          |     |     |      |
| <b>Recommended semester:</b> 3.                                                                                                                                                                                                                                                    |      |                                                          |     |     |      |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                      |      |                                                          |     |     |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                              |      |                                                          |     |     |      |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                        |      |                                                          |     |     |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                          |      |                                                          |     |     |      |
| <b>Class syllabus:</b><br>To improve offensive and defensive game combinations in collective sports. Practicing of tactical and technical elements in individual sports. Compensatory exercises to correct wrong body posture. Stretching. Competition rules in sport disciplines. |      |                                                          |     |     |      |
| <b>Recommended literature:</b>                                                                                                                                                                                                                                                     |      |                                                          |     |     |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                 |      |                                                          |     |     |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                      |      |                                                          |     |     |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 1081                                                                                                                                                                                                         |      |                                                          |     |     |      |
| A                                                                                                                                                                                                                                                                                  | B    | C                                                        | D   | E   | FX   |
| 99,44                                                                                                                                                                                                                                                                              | 0,37 | 0,0                                                      | 0,0 | 0,0 | 0,19 |
| <b>Lecturers:</b> PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický, Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Júlia Raábová, PhD., Mgr. Branislav Nedbálek                                        |      |                                                          |     |     |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                     |      |                                                          |     |     |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                               |      |                                                          |     |     |      |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                 |      |                                                          |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                      |      |                                                          |     |     |     |
| <b>Course ID:</b><br>FMFL.KTV/2-MXX-220/00                                                                                                                                                                                                                                                           |      | <b>Course title:</b><br>Physical Education and Sport (4) |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                |      |                                                          |     |     |     |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                                                                          |      |                                                          |     |     |     |
| <b>Recommended semester:</b> 4.                                                                                                                                                                                                                                                                      |      |                                                          |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                        |      |                                                          |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                |      |                                                          |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                          |      |                                                          |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                            |      |                                                          |     |     |     |
| <b>Class syllabus:</b><br>Sport training for Faculty Championships in a selected sport with modified rules. Selection of sport-talented students into teams of the Faculty Sport League, University League of Bratislava Faculties, and participation in sport events of the Faculty and University. |      |                                                          |     |     |     |
| <b>Recommended literature:</b>                                                                                                                                                                                                                                                                       |      |                                                          |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                   |      |                                                          |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                        |      |                                                          |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 957                                                                                                                                                                                                                            |      |                                                          |     |     |     |
| A                                                                                                                                                                                                                                                                                                    | B    | C                                                        | D   | E   | FX  |
| 99,37                                                                                                                                                                                                                                                                                                | 0,42 | 0,0                                                      | 0,0 | 0,1 | 0,1 |
| <b>Lecturers:</b> PaedDr. Dana Mašlejová, Mgr. Ladislav Mókus, Mgr. Ondrej Podkonický, Mgr. Jana Leginusová, Mgr. Tomáš Kuchár, PhD., PaedDr. Mikuláš Ortutay, Mgr. Martin Dovičák, PhD., Mgr. Branislav Nedbálek, Mgr. Júlia Raábová, PhD.                                                          |      |                                                          |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                       |      |                                                          |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                 |      |                                                          |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                     |      |                                                       |     |      |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                          |      |                                                       |     |      |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-115/15                                                                                                                                                                              |      | <b>Course title:</b><br>Physics of the Atomic Nucleus |     |      |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture / practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 / 1 <b>per level/semester:</b> 28 / 14<br><b>Form of the course:</b> on-site learning |      |                                                       |     |      |     |
| <b>Number of credits:</b> 4                                                                                                                                                                                              |      |                                                       |     |      |     |
| <b>Recommended semester:</b> 1.                                                                                                                                                                                          |      |                                                       |     |      |     |
| <b>Educational level:</b> II.                                                                                                                                                                                            |      |                                                       |     |      |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                    |      |                                                       |     |      |     |
| <b>Course requirements:</b>                                                                                                                                                                                              |      |                                                       |     |      |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                |      |                                                       |     |      |     |
| <b>Class syllabus:</b>                                                                                                                                                                                                   |      |                                                       |     |      |     |
| <b>Recommended literature:</b>                                                                                                                                                                                           |      |                                                       |     |      |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                       |      |                                                       |     |      |     |
| <b>Notes:</b>                                                                                                                                                                                                            |      |                                                       |     |      |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 26                                                                                                                                                 |      |                                                       |     |      |     |
| A                                                                                                                                                                                                                        | B    | C                                                     | D   | E    | FX  |
| 73,08                                                                                                                                                                                                                    | 7,69 | 11,54                                                 | 0,0 | 7,69 | 0,0 |
| <b>Lecturers:</b> doc. Mgr. Stanislav Antalic, PhD.                                                                                                                                                                      |      |                                                       |     |      |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                           |      |                                                       |     |      |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                     |      |                                                       |     |      |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                                                                |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                                                                |     |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-106/00                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       | <b>Course title:</b><br>Practical Exercises in Nuclear Physics and Electronics |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> laboratory practicals<br><b>Number of hours:</b><br><b>per week:</b> 4 <b>per level/semester:</b> 56<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                                            |       |                                                                                |     |     |     |
| <b>Number of credits:</b> 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                                                                |     |     |     |
| <b>Recommended semester:</b> 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                                                                |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                                                                |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |                                                                                |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                                                                |     |     |     |
| <b>Class syllabus:</b><br>Practical exercises consist of:<br>- the Laboratory work in Nuclear Physics (- Determine energy deposited in alfa, beta, gama and neutron detectors, Practically to familiarize with method of radioactivity measurement)<br>- the Laboratory work in Nuclear Electronics ( - Nuclear detector signal pulse shaping, Pulse application of amplifier in the timing and energy measurement, ADC - digitization of pulse high techniques, Timing measurement with coincidence sytem) |       |                                                                                |     |     |     |
| <b>Recommended literature:</b><br>Manual to practical exercises on web URL - <a href="http://www.dnp.fmph.uniba.sk/~kollar/navodnik.htm">http://www.dnp.fmph.uniba.sk/~kollar/navodnik.htm</a> .<br>Florek.:Praktikum z jadrovej fyziky a elektroniky. Textbook MFF UK 1982.<br>D.Kollár: Praktikum z elektroniky a automatizácie. Textbook MFF UK 1991.                                                                                                                                                    |       |                                                                                |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                                                |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 73                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                                                |     |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | B     | C                                                                              | D   | E   | FX  |
| 72,6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 26,03 | 1,37                                                                           | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> Mgr. Ivan Kontuľ, Mgr. Róbert Breier, PhD., Mgr. Jakub Zeman, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                                                                |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                                                |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                                                                |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                             |     |                                                                        |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                  |     |                                                                        |     |     |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-250/17                                                                                                                                                                      |     | <b>Course title:</b><br>Practicum of Data Analysis in Particle Physics |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> laboratory practicals<br><b>Number of hours:</b><br><b>per week:</b> 3 <b>per level/semester:</b> 42<br><b>Form of the course:</b> on-site learning |     |                                                                        |     |     |     |
| <b>Number of credits:</b> 4                                                                                                                                                                                      |     |                                                                        |     |     |     |
| <b>Recommended semester:</b> 3.                                                                                                                                                                                  |     |                                                                        |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                    |     |                                                                        |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                            |     |                                                                        |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                      |     |                                                                        |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                        |     |                                                                        |     |     |     |
| <b>Class syllabus:</b>                                                                                                                                                                                           |     |                                                                        |     |     |     |
| <b>Recommended literature:</b>                                                                                                                                                                                   |     |                                                                        |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                               |     |                                                                        |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                    |     |                                                                        |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 0                                                                                                                                          |     |                                                                        |     |     |     |
| A                                                                                                                                                                                                                | B   | C                                                                      | D   | E   | FX  |
| 0,0                                                                                                                                                                                                              | 0,0 | 0,0                                                                    | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> Mgr. Róbert Astaloš, PhD., Mgr. Pavol Bartoš, PhD.                                                                                                                                             |     |                                                                        |     |     |     |
| <b>Last change:</b> 10.05.2017                                                                                                                                                                                   |     |                                                                        |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                             |     |                                                                        |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                                                                     |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                                                     |     |     |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-245/00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     | <b>Course title:</b><br>Praktical in Monitoring of Radioactivity in the Environment |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> laboratory practicals<br><b>Number of hours:</b><br><b>per week: 5 per level/semester: 70</b><br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                                                                                                          |     |                                                                                     |     |     |     |
| <b>Number of credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |                                                                                     |     |     |     |
| <b>Recommended semester:</b> 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                                                     |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |                                                                                     |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |                                                                                     |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |                                                                                     |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |                                                                                     |     |     |     |
| <b>Class syllabus:</b><br>Determination of integral alfa and beta activity. Determination of 232-Th, 226-Ra and 40-K in natural samples using semiconductor gamma spectrometry. Measurement of 3-H using liquid scintillation spectrometry. Measurement of 14-C using gaseous proportional detector. Determination of 226-Ra in water using emanometric method. Determination of radon concentration in water and soil air. Alfa spectrometric determination of 218-Po and 214-Po in air. Applications of XRF method for control of pollutants in the environment. |     |                                                                                     |     |     |     |
| <b>Recommended literature:</b><br>Actual scientific publications.<br>Slovak technical norms for radioactivity measurement.<br>Š.Šáro: Detekcia a spektrometria žiarenia alfa a beta. Alfa Bratislava,1983.                                                                                                                                                                                                                                                                                                                                                         |     |                                                                                     |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |                                                                                     |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |                                                                                     |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                                                                                     |     |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | B   | C                                                                                   | D   | E   | FX  |
| 100,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0,0 | 0,0                                                                                 | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> doc. RNDr. Ivan Sýkora, PhD., RNDr. Monika Müllerová, PhD., Mgr. Ivan Kontuľ                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |                                                                                     |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |                                                                                     |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                                                                     |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                            |       |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                                            |       |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-121/00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       | <b>Course title:</b><br>Processing of Nuclear Physics Data |       |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                                            |       |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                                            |       |     |     |
| <b>Recommended semester:</b> 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                                            |       |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                            |       |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                                            |       |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |                                                            |       |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                            |       |     |     |
| <b>Class syllabus:</b><br>Describing the data, theoretical distributions, errors, estimations – likelihood function, basic estimators, maximum likelihood, the method of moments, least squares method, $\chi^2$ distribution, proof of the $\chi^2$ distribution. Probability and confidence – basic terms, mathematical probability, Bayesian statistics, confidence level, binomial confidence intervals, Poisson confidence intervals. Taking decisions – hypothesis testing (significance, power, Neyman Pearson test), interpreting experiments, the null hypothesis, binomial probabilities, goodness of fit, $\chi^2$ test, the run test, the Kolgomorov test. Two sample problem, matched and correlated samples. Ranking methods – nonparametric methods, Mann-Whitney test, matched pairs, Wilcoxon`s matched pairs signed rank test, measures of agreement – Spearmen`s correlation coefficient, concordance. Usage of computers for data processing and software features. |       |                                                            |       |     |     |
| <b>Recommended literature:</b><br>J. Hanousek, P. Charamza: Moderní metody zpracování dat, Educa`99, Praha, 1992<br>R. Barlow: Statistics, (Manchester Physics Series), J. Wiley&Sons, Chichester, 1999<br>L.Lyons: Statistics for nuclear and particle physicist, Cambridge University Press, 1992                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                            |       |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                                            |       |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                                            |       |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 66                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |       |                                                            |       |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | B     | C                                                          | D     | E   | FX  |
| 60,61                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 18,18 | 9,09                                                       | 12,12 | 0,0 | 0,0 |
| <b>Lecturers:</b> doc. RNDr. Ivan Sýkora, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                            |       |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                            |       |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                            |       |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                     |       |                                                               |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                          |       |                                                               |     |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-128/16                                                                                                                                                                              |       | <b>Course title:</b><br>Quantum Theory for Nuclear Physicists |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture / practicals<br><b>Number of hours:</b><br><b>per week:</b> 3 / 1 <b>per level/semester:</b> 42 / 14<br><b>Form of the course:</b> on-site learning |       |                                                               |     |     |     |
| <b>Number of credits:</b> 5                                                                                                                                                                                              |       |                                                               |     |     |     |
| <b>Recommended semester:</b> 1.                                                                                                                                                                                          |       |                                                               |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                            |       |                                                               |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                    |       |                                                               |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                              |       |                                                               |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                |       |                                                               |     |     |     |
| <b>Class syllabus:</b>                                                                                                                                                                                                   |       |                                                               |     |     |     |
| <b>Recommended literature:</b>                                                                                                                                                                                           |       |                                                               |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                       |       |                                                               |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                            |       |                                                               |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 19                                                                                                                                                 |       |                                                               |     |     |     |
| A                                                                                                                                                                                                                        | B     | C                                                             | D   | E   | FX  |
| 68,42                                                                                                                                                                                                                    | 26,32 | 5,26                                                          | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Fedor Šimkovic, CSc., Mgr. Dušan Štefánik, PhD.                                                                                                                                            |       |                                                               |     |     |     |
| <b>Last change:</b> 20.05.2016                                                                                                                                                                                           |       |                                                               |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                     |       |                                                               |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                 |     |                                                         |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                      |     |                                                         |      |      |      |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-126/00                                                                                                                                                                                                                                                                                                                                          |     | <b>Course title:</b><br>Radiation Environmental Physics |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week: 2 per level/semester: 28</b><br><b>Form of the course:</b> on-site learning                                                                                                                                                                                          |     |                                                         |      |      |      |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                                                                                                          |     |                                                         |      |      |      |
| <b>Recommended semester:</b> 2.                                                                                                                                                                                                                                                                                                                                                      |     |                                                         |      |      |      |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                        |     |                                                         |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                |     |                                                         |      |      |      |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                          |     |                                                         |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                            |     |                                                         |      |      |      |
| <b>Class syllabus:</b><br>Sources of radioactivity in biosphere. Distribution and transport of radionuclides in environment. Indoor and outdoor radon, its measurement and hazards. Techniques for measurement of radioactive pollutants. Study of environmental processes by the use of radionuclides. Environmental laws, radiation protection legislation, radiation dose limits. |     |                                                         |      |      |      |
| <b>Recommended literature:</b><br>Š. Šáro, J. Tolgyesy: Rádioaktivita prostredia, Alfa, Bratislava, 1985.<br>W. W. Nazaroff, A. V. Nero: Radon and its decay products in Indoor Air. Wiley, New York,1988.<br>M. Eisenbud, T. Gesell: Environmental Radioactivity. Academic Press, San Diego,1997.                                                                                   |     |                                                         |      |      |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                   |     |                                                         |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                        |     |                                                         |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 51                                                                                                                                                                                                                                                                                                             |     |                                                         |      |      |      |
| A                                                                                                                                                                                                                                                                                                                                                                                    | B   | C                                                       | D    | E    | FX   |
| 68,63                                                                                                                                                                                                                                                                                                                                                                                | 9,8 | 15,69                                                   | 1,96 | 1,96 | 1,96 |
| <b>Lecturers:</b> doc. RNDr. Karol Holý, CSc.                                                                                                                                                                                                                                                                                                                                        |     |                                                         |      |      |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                       |     |                                                         |      |      |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                 |     |                                                         |      |      |      |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                               |     |                                                |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                    |     |                                                |     |     |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-141/15                                                                                                                                                        |     | <b>Course title:</b><br>Rare Nuclear Processes |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |     |                                                |     |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                        |     |                                                |     |     |     |
| <b>Recommended semester:</b> 2.                                                                                                                                                                    |     |                                                |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                      |     |                                                |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                              |     |                                                |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                        |     |                                                |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                          |     |                                                |     |     |     |
| <b>Class syllabus:</b>                                                                                                                                                                             |     |                                                |     |     |     |
| <b>Recommended literature:</b>                                                                                                                                                                     |     |                                                |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                 |     |                                                |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                      |     |                                                |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 3                                                                                                                            |     |                                                |     |     |     |
| A                                                                                                                                                                                                  | B   | C                                              | D   | E   | FX  |
| 100,0                                                                                                                                                                                              | 0,0 | 0,0                                            | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> doc. RNDr. Jaroslav Staníček, PhD.                                                                                                                                               |     |                                                |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                     |     |                                                |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                               |     |                                                |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                  |      |                                              |      |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                       |      |                                              |      |      |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-161/00                                                                                                                                                            |      | <b>Course title:</b><br>Russian Language (1) |      |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |      |                                              |      |      |      |
| <b>Number of credits:</b> 2                                                                                                                                                                           |      |                                              |      |      |      |
| <b>Recommended semester:</b> 1.                                                                                                                                                                       |      |                                              |      |      |      |
| <b>Educational level:</b> I., II.                                                                                                                                                                     |      |                                              |      |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                 |      |                                              |      |      |      |
| <b>Course requirements:</b>                                                                                                                                                                           |      |                                              |      |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                             |      |                                              |      |      |      |
| <b>Class syllabus:</b><br>The subject provides a course in Russian language for beginners.                                                                                                            |      |                                              |      |      |      |
| <b>Recommended literature:</b><br>The textbook has not been published. It is at students' disposal in an electronic format.                                                                           |      |                                              |      |      |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                    |      |                                              |      |      |      |
| <b>Notes:</b>                                                                                                                                                                                         |      |                                              |      |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 654                                                                                                                             |      |                                              |      |      |      |
| A                                                                                                                                                                                                     | B    | C                                            | D    | E    | FX   |
| 60,4                                                                                                                                                                                                  | 15,9 | 10,09                                        | 4,74 | 1,83 | 7,03 |
| <b>Lecturers:</b> PhDr. Elena Klátiková                                                                                                                                                               |      |                                              |      |      |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                        |      |                                              |      |      |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                  |      |                                              |      |      |      |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                  |       |                                              |      |     |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                       |       |                                              |      |     |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-162/00                                                                                                                                                            |       | <b>Course title:</b><br>Russian Language (2) |      |     |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |       |                                              |      |     |      |
| <b>Number of credits:</b> 2                                                                                                                                                                           |       |                                              |      |     |      |
| <b>Recommended semester:</b> 2.                                                                                                                                                                       |       |                                              |      |     |      |
| <b>Educational level:</b> I., II.                                                                                                                                                                     |       |                                              |      |     |      |
| <b>Prerequisites:</b>                                                                                                                                                                                 |       |                                              |      |     |      |
| <b>Course requirements:</b>                                                                                                                                                                           |       |                                              |      |     |      |
| <b>Learning outcomes:</b>                                                                                                                                                                             |       |                                              |      |     |      |
| <b>Class syllabus:</b><br>The subject continues the program of Russian language (1) and provides a course of Russian for beginners.                                                                   |       |                                              |      |     |      |
| <b>Recommended literature:</b><br>The textbook has not been published. It is at students' disposal in an electronic format.                                                                           |       |                                              |      |     |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                    |       |                                              |      |     |      |
| <b>Notes:</b>                                                                                                                                                                                         |       |                                              |      |     |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 399                                                                                                                             |       |                                              |      |     |      |
| A                                                                                                                                                                                                     | B     | C                                            | D    | E   | FX   |
| 65,66                                                                                                                                                                                                 | 15,79 | 9,02                                         | 4,01 | 1,0 | 4,51 |
| <b>Lecturers:</b> PhDr. Elena Klátiková                                                                                                                                                               |       |                                              |      |     |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                        |       |                                              |      |     |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                  |       |                                              |      |     |      |

## COURSE DESCRIPTION

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------|------|-----|------|
| <b>University:</b> Comenius University in Bratislava                                                                                                                                                          |       |                                              |      |     |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                               |       |                                              |      |     |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-261/00                                                                                                                                                                    |       | <b>Course title:</b><br>Russian Language (3) |      |     |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning         |       |                                              |      |     |      |
| <b>Number of credits:</b> 2                                                                                                                                                                                   |       |                                              |      |     |      |
| <b>Recommended semester:</b> 3.                                                                                                                                                                               |       |                                              |      |     |      |
| <b>Educational level:</b> I., II.                                                                                                                                                                             |       |                                              |      |     |      |
| <b>Prerequisites:</b>                                                                                                                                                                                         |       |                                              |      |     |      |
| <b>Course requirements:</b>                                                                                                                                                                                   |       |                                              |      |     |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                     |       |                                              |      |     |      |
| <b>Class syllabus:</b><br>The course "Russian for Intermediate Students" is a follow-up to "Russian for Beginners". The subject of the course is general Russian in the range appropriate to the given level. |       |                                              |      |     |      |
| <b>Recommended literature:</b><br>The textbook has not been published. It is at students' disposal in an electronic format.                                                                                   |       |                                              |      |     |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                            |       |                                              |      |     |      |
| <b>Notes:</b>                                                                                                                                                                                                 |       |                                              |      |     |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 196                                                                                                                                     |       |                                              |      |     |      |
| A                                                                                                                                                                                                             | B     | C                                            | D    | E   | FX   |
| 70,41                                                                                                                                                                                                         | 17,35 | 8,67                                         | 2,55 | 0,0 | 1,02 |
| <b>Lecturers:</b> PhDr. Elena Klátiková                                                                                                                                                                       |       |                                              |      |     |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                |       |                                              |      |     |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                          |       |                                              |      |     |      |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                          |       |                                              |     |      |      |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                               |       |                                              |     |      |      |
| <b>Course ID:</b><br>FMFL.KJP/1-MXX-262/00                                                                                                                                                                    |       | <b>Course title:</b><br>Russian Language (4) |     |      |      |
| <b>Educational activities:</b><br><b>Type of activities:</b> practicals<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning         |       |                                              |     |      |      |
| <b>Number of credits:</b> 2                                                                                                                                                                                   |       |                                              |     |      |      |
| <b>Recommended semester:</b> 4.                                                                                                                                                                               |       |                                              |     |      |      |
| <b>Educational level:</b> I., II.                                                                                                                                                                             |       |                                              |     |      |      |
| <b>Prerequisites:</b>                                                                                                                                                                                         |       |                                              |     |      |      |
| <b>Course requirements:</b>                                                                                                                                                                                   |       |                                              |     |      |      |
| <b>Learning outcomes:</b>                                                                                                                                                                                     |       |                                              |     |      |      |
| <b>Class syllabus:</b><br>The course "Russian for Intermediate Students" is a follow-up to "Russian for Beginners". The subject of the course is general Russian in the range appropriate to the given level. |       |                                              |     |      |      |
| <b>Recommended literature:</b><br>The textbook has not been published. It is at students' disposal in an electronic format.                                                                                   |       |                                              |     |      |      |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                            |       |                                              |     |      |      |
| <b>Notes:</b>                                                                                                                                                                                                 |       |                                              |     |      |      |
| <b>Past grade distribution</b><br>Total number of evaluated students: 138                                                                                                                                     |       |                                              |     |      |      |
| A                                                                                                                                                                                                             | B     | C                                            | D   | E    | FX   |
| 75,36                                                                                                                                                                                                         | 13,04 | 7,25                                         | 2,9 | 0,72 | 0,72 |
| <b>Lecturers:</b> PhDr. Elena Klátiková                                                                                                                                                                       |       |                                              |     |      |      |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                |       |                                              |     |      |      |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                          |       |                                              |     |      |      |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                                                 |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                                                 |     |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-232/00                                                                                                                                                                                                                                                                                                                                                                                                                                            |       | <b>Course title:</b><br>Selected Chapters in Gamma Spectroscopy |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                                     |       |                                                                 |     |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                                                 |     |     |     |
| <b>Recommended semester:</b> 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |                                                                 |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                                 |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                                                 |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                                                 |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                                 |     |     |     |
| <b>Class syllabus:</b><br>Creation and formig of signals in semiconductor detectors, principles of operation and types of semiconductor detectors, characteristic of semiconductor detectors, the signal transmission, electronics for pulse signal processing, perturbing influence of heavy current distribution, cryogenic detectors – types, principles of operation, physical applications.                                                                                       |       |                                                                 |     |     |     |
| <b>Recommended literature:</b><br>W.R. Leo, Techniques for nuclear and particle physics, Springer Verlag, Berlin, 1996<br>J. V. Melikov, Experimentalnaja tehnika v jadernoj fizike, MGU, Moskva, 1973<br>K. Klainknecht, Detectors for particle radiation, Cambridge University Press, 1998<br>J. Šeda, J. Sabol, J. Kubálek, Jaderná elektronika, SNTL, Praha, 1977<br>N. E. Booth, B. Cabrera, E. Fiorini, Low temperature particle detectors, Ann. Rev. Nucl. Part. Sci. ,46, 1996 |       |                                                                 |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                                 |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                                                                 |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 17                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                 |     |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | B     | C                                                               | D   | E   | FX  |
| 52,94                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 41,18 | 5,88                                                            | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> doc. RNDr. Ivan Sýkora, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                                                 |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |                                                                 |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                                                                 |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                             |     |                                                                   |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                  |     |                                                                   |     |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-203/00                                                                                                                                                                                                                                                      |     | <b>Course title:</b><br>Seminar in Nuclear and Subnuclear Physics |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> seminar<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning                                                                                               |     |                                                                   |     |     |     |
| <b>Number of credits:</b> 2                                                                                                                                                                                                                                                                      |     |                                                                   |     |     |     |
| <b>Recommended semester:</b> 4.                                                                                                                                                                                                                                                                  |     |                                                                   |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                    |     |                                                                   |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                            |     |                                                                   |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                      |     |                                                                   |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                        |     |                                                                   |     |     |     |
| <b>Class syllabus:</b><br>Presentation of modern trends in nuclear and sub-nuclear physics, new achievements in the field of interest. Presentation of the scientific programs of large international nuclear institutes as CENR Geneva, JINR Dubna, GSI Darmstadt, DESY Hamburg, Fermilab, etc. |     |                                                                   |     |     |     |
| <b>Recommended literature:</b><br>WEB sites of nuclear physics institutes,<br>Journals: Physics Today, CERN Courier, Progress in Physics, Scintific American, Nuclear Physics News, Europhysics News, Nuclear Physics News International and others.                                             |     |                                                                   |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                               |     |                                                                   |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                    |     |                                                                   |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 66                                                                                                                                                                                                                         |     |                                                                   |     |     |     |
| A                                                                                                                                                                                                                                                                                                | B   | C                                                                 | D   | E   | FX  |
| 98,48                                                                                                                                                                                                                                                                                            | 0,0 | 1,52                                                              | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                               |     |                                                                   |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                   |     |                                                                   |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                             |     |                                                                   |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                 |      |                                                                  |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                      |      |                                                                  |     |     |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-109/00                                                                                                                                                                                                                                                                                                                                                                                          |      | <b>Course title:</b><br>Special Practical in Nuclear Physics (1) |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> laboratory practicals<br><b>Number of hours:</b><br><b>per week:</b> 4 <b>per level/semester:</b> 56<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                     |      |                                                                  |     |     |     |
| <b>Number of credits:</b> 4                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                                                  |     |     |     |
| <b>Recommended semester:</b> 2.                                                                                                                                                                                                                                                                                                                                                                                                      |      |                                                                  |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                                                  |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                |      |                                                                  |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                                                  |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                            |      |                                                                  |     |     |     |
| <b>Class syllabus:</b><br>Half-time decay measurement of the long life isotopes, determining the concentration of some isotopes in the enviroment, $\alpha$ , $\beta$ , $\gamma$ radiation spectrometry by ionization chamber, semiconductor and scintilation detectors, fission fragment spectrometry, measurement of the nucleus radius, neutron activation analysis, detection of neutrons and determination of the neutron flux. |      |                                                                  |     |     |     |
| <b>Recommended literature:</b><br>M. Florek a kol. Practical from nuclear physics and electronic, UK edition center, 1990                                                                                                                                                                                                                                                                                                            |      |                                                                  |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                   |      |                                                                  |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                                                  |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 66                                                                                                                                                                                                                                                                                                                                                             |      |                                                                  |     |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                    | B    | C                                                                | D   | E   | FX  |
| 60,61                                                                                                                                                                                                                                                                                                                                                                                                                                | 30,3 | 9,09                                                             | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> RNDr. Imrich Szarka, CSc.                                                                                                                                                                                                                                                                                                                                                                                          |      |                                                                  |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                       |      |                                                                  |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                 |      |                                                                  |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                                                                  |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                                                  |     |     |     |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-209/00                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      | <b>Course title:</b><br>Special Practical in Nuclear Physics (2) |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> laboratory practicals<br><b>Number of hours:</b><br><b>per week:</b> 5 <b>per level/semester:</b> 70<br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                                                        |      |                                                                  |     |     |     |
| <b>Number of credits:</b> 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |                                                                  |     |     |     |
| <b>Recommended semester:</b> 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                                                  |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |                                                                  |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |                                                                  |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |                                                                  |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |                                                                  |     |     |     |
| <b>Class syllabus:</b><br>Determining of relative intensities of gamma rays using the scintillation detector. Usage of the liquid scintillation spectrometry for the alpha and beta spectra analysis. Principles of application of directional scintillation detector. Characteristics of Ge(Li) and HPGe detectors, methods of evaluation of the peak efficiency of HPGe detector, multicomponent spectra analysis. Coincidence methods of gamma-ray spectrometry. The analysis of the <sup>152</sup> Eu decay scheme. |      |                                                                  |     |     |     |
| <b>Recommended literature:</b><br>S. Usačev a kol.: Experimentálna jadrová fyzika, ALFA-SNTL, Bratislava 1982<br>Š.Šáro : Detekcia a spektrometria žiarenia alfa a beta. Alfa, Bratislava, 1983<br>G.F. Knoll: Radiation Detection and Measurement, John Wiley & Sons, 2000<br>W.R. Leo: Techniques for Nuclear and Particle Physics Experiments, Springer Verlag, 1994                                                                                                                                                 |      |                                                                  |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                                                                  |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |                                                                  |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 67                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                                                                  |     |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | B    | C                                                                | D   | E   | FX  |
| 92,54                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5,97 | 1,49                                                             | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> doc. RNDr. Jaroslav Staníček, PhD., doc. RNDr. Ivan Sýkora, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                                                                  |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                                                  |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |                                                                  |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                           |     |                                             |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                |     |                                             |     |     |     |
| <b>Course ID:</b><br>FMFL.KTV/2-MXX-115/17                                                                                                                                     |     | <b>Course title:</b><br>Sports in Natur (1) |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b><br><b>Number of hours:</b><br><b>per week: per level/semester:</b><br><b>Form of the course:</b> on-site learning |     |                                             |     |     |     |
| <b>Number of credits:</b> 2                                                                                                                                                    |     |                                             |     |     |     |
| <b>Recommended semester:</b> 1.                                                                                                                                                |     |                                             |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                  |     |                                             |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                          |     |                                             |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                    |     |                                             |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                      |     |                                             |     |     |     |
| <b>Class syllabus:</b>                                                                                                                                                         |     |                                             |     |     |     |
| <b>Recommended literature:</b>                                                                                                                                                 |     |                                             |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                             |     |                                             |     |     |     |
| <b>Notes:</b>                                                                                                                                                                  |     |                                             |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 30                                                                                                       |     |                                             |     |     |     |
| A                                                                                                                                                                              | B   | C                                           | D   | E   | FX  |
| 100,0                                                                                                                                                                          | 0,0 | 0,0                                         | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> Mgr. Branislav Nedbálek                                                                                                                                      |     |                                             |     |     |     |
| <b>Last change:</b>                                                                                                                                                            |     |                                             |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                           |     |                                             |     |     |     |

## COURSE DESCRIPTION

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| <b>University:</b> Comenius University in Bratislava                                                                                                                           |     |                                             |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                |     |                                             |     |     |     |
| <b>Course ID:</b><br>FMFL.KTV/2-MXX-116/18                                                                                                                                     |     | <b>Course title:</b><br>Sports in Natur (2) |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b><br><b>Number of hours:</b><br><b>per week: per level/semester:</b><br><b>Form of the course:</b> on-site learning |     |                                             |     |     |     |
| <b>Number of credits:</b> 2                                                                                                                                                    |     |                                             |     |     |     |
| <b>Recommended semester:</b> 2.                                                                                                                                                |     |                                             |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                  |     |                                             |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                          |     |                                             |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                    |     |                                             |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                      |     |                                             |     |     |     |
| <b>Class syllabus:</b>                                                                                                                                                         |     |                                             |     |     |     |
| <b>Recommended literature:</b>                                                                                                                                                 |     |                                             |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                             |     |                                             |     |     |     |
| <b>Notes:</b>                                                                                                                                                                  |     |                                             |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 9                                                                                                        |     |                                             |     |     |     |
| A                                                                                                                                                                              | B   | C                                           | D   | E   | FX  |
| 100,0                                                                                                                                                                          | 0,0 | 0,0                                         | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> Mgr. Branislav Nedbálek                                                                                                                                      |     |                                             |     |     |     |
| <b>Last change:</b>                                                                                                                                                            |     |                                             |     |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                           |     |                                             |     |     |     |

## COURSE DESCRIPTION

|                                                                                                                                                                                                    |      |                                                                           |      |     |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------|------|-----|-----|
| <b>University:</b> Comenius University in Bratislava                                                                                                                                               |      |                                                                           |      |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                    |      |                                                                           |      |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-143/16                                                                                                                                                        |      | <b>Course title:</b><br>Standard Model from Experimentalist Point of View |      |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week:</b> 2 <b>per level/semester:</b> 28<br><b>Form of the course:</b> on-site learning |      |                                                                           |      |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                        |      |                                                                           |      |     |     |
| <b>Recommended semester:</b> 2.                                                                                                                                                                    |      |                                                                           |      |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                      |      |                                                                           |      |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                              |      |                                                                           |      |     |     |
| <b>Course requirements:</b>                                                                                                                                                                        |      |                                                                           |      |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                          |      |                                                                           |      |     |     |
| <b>Class syllabus:</b>                                                                                                                                                                             |      |                                                                           |      |     |     |
| <b>Recommended literature:</b>                                                                                                                                                                     |      |                                                                           |      |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                 |      |                                                                           |      |     |     |
| <b>Notes:</b>                                                                                                                                                                                      |      |                                                                           |      |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 8                                                                                                                            |      |                                                                           |      |     |     |
| A                                                                                                                                                                                                  | B    | C                                                                         | D    | E   | FX  |
| 37,5                                                                                                                                                                                               | 37,5 | 12,5                                                                      | 12,5 | 0,0 | 0,0 |
| <b>Lecturers:</b> Mgr. Róbert Astaloš, PhD., Mgr. Pavol Bartoš, PhD., prof. RNDr. Stanislav Tokár, DrSc.                                                                                           |      |                                                                           |      |     |     |
| <b>Last change:</b> 26.05.2016                                                                                                                                                                     |      |                                                                           |      |     |     |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.                                                                                                                                               |      |                                                                           |      |     |     |

## STATE EXAM DESCRIPTION

|                                                                 |                                             |
|-----------------------------------------------------------------|---------------------------------------------|
| <b>University:</b> Comenius University in Bratislava            |                                             |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics |                                             |
| <b>Course ID:</b><br>FMFL.KJFB/2-FJF-959/15                     | <b>Course title:</b><br>Sub-nuclear Physics |
| <b>Number of credits:</b> 2                                     |                                             |
| <b>Educational level:</b> II.                                   |                                             |
| <b>State exam syllabus:</b>                                     |                                             |
| <b>Last change:</b> 02.06.2015                                  |                                             |
| <b>Approved by:</b> prof. RNDr. Jozef Masarik, DrSc.            |                                             |

## COURSE DESCRIPTION

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |                                                        |     |     |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------|-----|-----|-----|
| <b>University:</b> Comenius University in Bratislava                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |                                                        |     |     |     |
| <b>Faculty:</b> Faculty of Mathematics, Physics and Informatics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |                                                        |     |     |     |
| <b>Course ID:</b><br>FMFI.KJFB/2-FJF-231/00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     | <b>Course title:</b><br>Theory of Many-Nucleon Systems |     |     |     |
| <b>Educational activities:</b><br><b>Type of activities:</b> lecture<br><b>Number of hours:</b><br><b>per week: 2 per level/semester: 28</b><br><b>Form of the course:</b> on-site learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                                        |     |     |     |
| <b>Number of credits:</b> 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                                        |     |     |     |
| <b>Recommended semester:</b> 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |                                                        |     |     |     |
| <b>Educational level:</b> II.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                                        |     |     |     |
| <b>Prerequisites:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |                                                        |     |     |     |
| <b>Course requirements:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                                        |     |     |     |
| <b>Learning outcomes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |                                                        |     |     |     |
| <b>Class syllabus:</b><br>Nucleon-nucleon interaction (one-boson exchange potential), phase analysis of NN interaction, G-matrices (Bethe-Goldstone equation), Slater determinant, second quantization, Hartree-Fock theory, description of excited states of nucleus, Tamm-Dancoff approximation, nuclear ground state correlations, random phase approximation (RPA), RPA equation, sum rules, proton-proton, neutron-neutron and proton-neutron pairing interactions, Hartree-Fock Bogoliubov transformation, Barden-Cooper-Schrieffer (BCS) equation, quasiparticle RPA, giant resonances (Gamow-Teller, isobaric analogue states), many-body Green functions of beta transitions, many-body studies within schematic models (Lipkin model, SO(5) model), Monte-Carlo shell model S-matrix and its expansion, mean field theory, Brueckner G-matrices, Walecka model. |     |                                                        |     |     |     |
| <b>Recommended literature:</b><br>G.E. Brown: Many-body problems<br>P.Ring P. Schuck: The nuclear many-body problem<br>J. Eisenberg, B. Greiner: Nuclear Theory<br>D.A. Kirzhnits: Field Theoretical Methods in Many-Body Systems<br>J.D. Walecka: Quantum Theory of Many-particle systems                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |                                                        |     |     |     |
| <b>Languages necessary to complete the course:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |                                                        |     |     |     |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                                        |     |     |     |
| <b>Past grade distribution</b><br>Total number of evaluated students: 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |                                                        |     |     |     |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | B   | C                                                      | D   | E   | FX  |
| 100,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0,0 | 0,0                                                    | 0,0 | 0,0 | 0,0 |
| <b>Lecturers:</b> prof. RNDr. Fedor Šimkovic, CSc., Mgr. Dušan Štefánik, PhD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                                        |     |     |     |
| <b>Last change:</b> 02.06.2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                                                        |     |     |     |

**Approved by:** prof. RNDr. Jozef Masarik, DrSc.