

Comenius University in Bratislava
Faculty of Natural Sciences
Academic year 2011-12

BACHELOR STUDY (Bc / 3 years study)

Field of study: 4.1.14 Chemistry

Study program: Chemistry

Compulsory courses

| Course No. | Course title – Lecturer | Semester | Course type | ECTS credits |
|------------|--|----------|-------------|--------------|
| N-bCXX-001 | Mathematics (1) - Švaňa P. (FMFI) | 1/W | L4,P3 | 8 |
| N-bCXX-002 | Physics (1) - Košinár I. (FMFI) | 1/W | L4,S2 | 7 |
| N-bCXX-003 | General chemistry - Pavelčík F. | 1/W | L4,S2 | 7 |
| N-bCXX-004 | Mathematics (2) - Švaňa P. (FMFI) | 1/S | L2,P2 | 5 |
| N-bCXX-005 | Physics (2) - Košinár I. (FMFI) | 1/S | L2,S2 | 5 |
| N-bCXX-006 | Inorganic chemistry - Schwendt P., Tatiersky J. | 1/S | L4,S2,P6 | 15 |
| N-bCXX-007 | Organic chemistry (1) - Zahradník P. (KFZ), Mečiarová M., Putala M., Sališová M., Šebesta R., Magdolen P. | 1/S | L2,S2 | 5 |
| N-bCXX-008 | Physics (3) - Mahel' M. (FMFI) Prerequisite: N-bCXX-005! | 2/W | L3,P4 | 8 |
| N-bCXX-009 | Organic chemistry (2) - Zahradník P. (KFZ), Šebesta R., Magdolen P., Putala M., Mečiarová M., Poláčková V. Prerequisite: N-bCXX-007! | 2/W | L3,S2,P5 | 12 |
| N-bCXX-010 | Physical chemistry (1) - Ševčík P., Kellö V. Prerequisite: N-bCXX-003! a N-bCXX-005! a N-bCXX-004! | 2/W | L3,P1 | 5 |
| N-bCXX-011 | Nuclear chemistry (1) - Macáček F. Prerequisite: N-bCXX-003! | 2/W | L2 | 3 |
| N-bCXX-012 | Physical chemistry (2) - Adamčíková L., Benko J., Valent I., Neogrády P., Olexová A., Aranyosiová M. Prerequisite: N-bCXX-010! | 2/S | L3,S2,P5 | 12 |
| N-bCXX-013 | Analytical chemistry (1) - Marák J. Hutta M. Prerequisite: N-bCXX-003! | 2/S | L2,S2 | 5 |
| N-bCXX-014 | Biochemistry (1) - Kollárová M., Polčic P. | 2/S | L4,S1,P4 | 9 |
| N-bCXX-015 | Nuclear chemistry (2) - Roszkopfová O. | 2/S | | 3 |
| N-bCXX-016 | Analytical chemistry (2) – Hutta M., Marák J. Prerequisite: N-bCXX-013! a N-bCXX-012! | 3/W | L2,S2,P6 | 12 |
| N-bCXX-017 | Theory of chemical bond - Kellö V. Prerequisite: N-bCXX-012! | 3/W | L2,S1 | 4 |
| N-bCXX-018 | Numerical methods in chemistry - Černušák I., Noga J. Prerequisite: N-bCXX-012! | 3/W | L2 | 3 |
| N-bCXX-019 | Chemical structure - Kellö V., Černušák I. | 3/S | L3 | 4 |
| N-bCXX-045 | Methods of spectral analysis - Horváth B., Šebesta R., Kuruc J., Gáplovský A., Žemberyová M. | 3/S | L3,S3 | 7 |

Bachelor thesis

| | | | | |
|------------|--|-----|--|---|
| N-bCAL-901 | Bachelor thesis from analytical chemistry - KAL | 3/S | | 8 |
|------------|--|-----|--|---|

Bachelor thesis seminary

| | | | | |
|------------|--|-----|----|---|
| N-bCAL-902 | Bachelor thesis seminary from analytical chemistry -KAL | 3/S | S2 | 2 |
|------------|--|-----|----|---|

Compulsory-optional courses for bachelor thesis from analytical chemistry

| | | | | |
|------------|--|-----|----------|---|
| N-bCAL-033 | Introduction into chemometrics - Marák J., Staňová A. | 3/W | L2,S2 | 5 |
| N-bCAL-034 | Special seminary - KAL | 3/W | L2 | 4 |
| N-bCAL-035 | Chemical reactions and stabilities in analytical processes - Marák J., Chalányová M. Prerequisite: N-bCXX-013! | 3/S | L2,S1,P5 | 5 |
| N-bCAL-036 | Electroanalytical chemistry - Bodor R., Masár M. | 3/S | L2,S1 | 3 |
| N-bCAL-002 | Separation methods - Hutta M., Masár M. | 3/S | L2,S1 | 3 |

Optional courses

| | | | | |
|------------|--|-----|-------|---|
| N-bCXX-020 | Seminary for calculations in chemistry (1) - Tatiersky J. | 1/W | S2 | 3 |
| N-bCXX-021 | Mathematics used in physics – Košinár I. (FMFI) | 1/W | L1,P2 | 4 |
| N-bCXX-022 | Supplementary seminary from mathematics (1) - Košinárová A. | 1/W | S2 | 3 |
| N-bCXX-023 | Supplementary seminary from physics (1) - Košinár I. | 1/W | L1,S1 | 3 |
| N-bCXX-024 | Cytology for chemists - Hudák J. | 1/W | L2 | 3 |
| N-bCXX-025 | General biology (1) - Tomáška L. | 1/W | L2 | 2 |
| N-bCXX-026 | Seminary for calculations in chemistry (2) - Tatiersky J., Fajnor V. | 1/S | S2 | 3 |
| N-bCXX-044 | Supplementary seminary from organic chemistry - Záhradník P. | 1/S | S1 | 2 |
| N-bCXX-027 | What is physical chemistry ? - Olexová A. | 1/S | L1,S1 | 3 |
| N-bCXX-028 | Supplementary seminary from mathematics (2) - Košinárová A. (FMFI) | 1/S | S2 | 3 |
| N-bCXX-029 | Laboratory technology - Masár M., Halko R., Poláčková V., Velič D. | 1/S | L4 | 5 |
| N-bCXX-030 | Supplementary seminary from physics (2) - Košinár I. (FMFI) | 1/S | S2 | 3 |
| N-bCXX-031 | General biology (2) - Tomáška L. | 1/S | L2 | 2 |
| N-bCXX-032 | Identification and quantification of chemical compounds - Hutta M., Chalányová M., Marák J., Bodor R., Masár M., Kaniánsky D. | 2/W | L1,S1 | 3 |
| N-bCXX-033 | Supplementary seminary from physical chemistry (1) - Benko J., Janek M. | 2/W | S2 | 3 |
| N-bCXX-041 | Chemical modelling on PC - Černušák I., Valent I. | 2/W | P2 | 3 |
| N-bCXX-034 | Seminary from organic synthesis - Sališová M. | 2/W | S2 | 3 |
| N-bMHB-014 | General genetics (1) - Vlčková V. | 2/W | L2,P2 | 4 |
| N-bCXX-036 | Processing of experimental data - Sýkora I. (FMFI) | 2/W | L2 | 3 |
| N-bCXX-037 | Supplementary seminary from physical chemistry (2) - Grančičová O. | 2/S | S2 | 3 |
| N-bMHB-015 | General genetics (2) - Vlčková V. | 2/S | L1,P1 | 2 |
| N-bCXX-039 | Utilization of PC in chemistry - Strašík S. | 2/S | P2 | 3 |
| N-bCXX-040 | Introduction into biotechnology - Sulo P. | 2/S | L1 | 1 |
| N-bCXX-042 | Chemical praxis - SC | 2/S | | 3 |
| N-bCOR-032 | New trends in organic chemistry - Zahradník P., Mečiarová M. | 2/S | L2 | 3 |
| N-bCAG-035 | Application software in chemistry - Rakovský E., Tatiersky J. | 3/W | P2 | 3 |
| N-bCAL-005 | Instrument electronics - Iványi F. | 3/W | L1,P3 | 5 |
| N-bCBI-003 | Seminary from molecular biology (1) - Nosek J. | 3/W | S2 | 2 |
| N-bCBI-102 | Biochemistry 2 - seminary - Korduláková J., Mikušová K. | 3/W | S2 | 2 |
| N-bCEC-030 | Environmentalism - Fargašová A. | 3/W | L2 | 3 |
| N-bCJD-035 | Marked compounds - Kuruc J. | 3/W | L2 | 3 |
| N-bBMO-004 | Bioinformatics - Kľučár L. | 3/W | L2,P2 | 5 |
| N-bEEF-007 | Preservation of biodiversity - Zlínská J. | 3/W | L2 | 4 |
| N-bEEG-023 | Geomistry of environment - Milička J., Jurkovič E. | 3/W | L3 | 5 |
| N-bGCH-029 | Medical geochemistry - Khun M. | 3/W | L2 | 3 |
| N-bCEC-001 | Chemistry and environment - Ostrovský I. | 3/W | L2,S1 | 3 |
| N-bBMI-005 | Imunology - Kontseková E. | 3/S | L2 | 2 |
| N-bCAG-002 | Introduction into chemistry of solid compounds - Plesch G. | 3/S | L2 | 2 |
| N-bCBI-005 | Biochemistry of physiological functions (1) - Brechtlová M., Liška Br., Halčák L., Turecký L., Mikušová K. | 3/S | L3,S1 | 5 |
| N-bCBI-009 | Seminary from molecular biology (2) - Neboháčová M. | 3/S | S2 | 2 |
| N-bCJD-025 | Chemical informatics - Kuruc J., Dulanská S. | 3/S | L1,S1 | 3 |
| N-bCJD-026 | Isotopes in biochemistry - Rajec P., Roszkopfová O. | 3/S | L1,S1 | 3 |
| N-bCJD-028 | Chemistry of high energies - Kuruc J. | 3/S | L2 | 3 |
| N-bCOR-050 | Organic chemistry (3) - Putala M. | 3/S | L1,S1 | 4 |
| N-bEEG-020 | Hydrogeochemics - Lánčos T. | 3/S | L2,P2 | 4 |
| N-bEPD-004 | General pedochemistry - Dlapa P., Kubová J., Medved' J., Bujdoš M., Matúš P., Turanová L. | 3/S | L2,P3 | 4 |

Bachelor state exam courses- compulsory

N-CHXX-0BS Chemistry

Bachelor state exam courses– compulsory-optional*compulsory choice: 1course*

N-CHXX-0BS Spectral methods in chemistry
N-CHXX-0BS Separation and isolation of chemical compounds
N-CHXX-0BS Biochemic methods

L – Lecture, S – seminary, P – practice

Comments:

| | |
|------------|--|
| N–bXMA–001 | Seminary from mathematics is suitable for students, who had mathematics in secondary school on lower level. It helps to manage the courses N–bCXX–001 and N–bCXX–004 |
| N–bCXX–001 | „Supplementary seminary from mathematics 1“ is recommended here as subsidiary course. |
| N–bCXX–002 | „Mathematics for physics“ and „Supplementary seminary from physics 1“ are recommended here as subsidiary courses. |
| N–bCXX–004 | „Supplementary seminary from mathematics 2“ is recommended here as subsidiary course. |
| N–bCXX–005 | „Supplementary seminary from physics 1“ is recommended here as subsidiary course. |
| N–bCXX–006 | „Seminary for calculations in chemistry 1“ is recommended here as subsidiary course. |
| N–bCXX–008 | „Processing of experimental data“ is recommended here as subsidiary course. |
| N–bCXX–009 | „Seminary from organic synthesis“ “ is recommended here as subsidiary course. Condition for taking the exam is minimum 50% of points from seminary and practice. |
| N–bCXX–010 | „Supplementary seminary from physical chemistry 1“ is recommended here as subsidiary course. |
| N–bCXX–012 | „Supplementary seminary from physical chemistry 1“ and „Chemical modeling on PC“ are recommended here as subsidiary courses. |
| N–bCXX–015 | Course starts during the exam period of semester and lasts 7 days. |
| N–bCXX–018 | „Programming in chemistry“ is recommended here as subsidiary course. |
| N–bCXX–024 | Course is recommended for students, who decide to write bachelor thesis from biochemistry and biotechnology. |
| N–bCXX–025 | Course is recommended for students, who decide to write bachelor thesis from biochemistry and biotechnology. |
| N–bCXX–031 | Course is recommended for students, who decide to write bachelor thesis from biochemistry and biotechnology. |
| N–bXCJ–001 | Condition for taking this course is minimum 60 points from 100 in entry exam. Students, who achieve less than 60 points, have to improve their language skill by themselves. Students are obligated to pass the exam from technical English before applying for bachelor state exam. |
| N–bCXX–035 | Course is recommended for students, who decide to write bachelor thesis from biochemistry and biotechnology. |
| N–bCXX–038 | Course is recommended for students, who decide to write bachelor thesis from biochemistry and biotechnology. |
| N–bCXX–040 | Course is recommended for students, who decide to write bachelor thesis from biochemistry and biotechnology. |
| N–bCXX–042 | Praxis is intended for students, who are working in departments within the scope of SVOC. |
| N–bCAL–002 | Course starts during the exam period of semester in turns. |
| N–bCXX–029 | Course is recommended for improving the basic knowledge of laboratory technique in organic, physical and analytical chemistry, exclusively before taking the laboratory practice in these mentioned courses. Course starts during the exam period of semester in turns. |
| N–bCXX–017 | Course is linked with N–bCXX–008. Therefore is recommended to start this course after taking N–bCXX–008. |

MASTER STUDY (MSc / 2 years study)**Field of study:** 4.1.14 Chemistry**Study program:** Analytical Chemistry**Compulsory courses**

| Course No. | Course title- Lecturer | Semester | Course type | ECTS credit |
|------------|--|----------|-------------|-------------|
| N-mCAL-037 | Advanced methods in chemometry - <i>Marák J., Staňová A.</i> | 1/W | S2 | 3 |
| N-mCAL-014 | Atomic spectrometry - <i>Žemberyová M., Macháčková L.</i> | 1/W | L2,S1 | 4 |
| N-mCAL-015 | Exercise of optical methods - <i>Žemberyová M., Medved' J., Barteková J., Krištín J. (KFR)</i> | 1/W | Lw8 | 9 |
| N-mCAL-038 | Electrochemical methods of chemical analysis - <i>Bodor R., Masár M.</i> | 1/W | L1,S1,Lw5 | 9 |
| N-mCAL-018 | Electroreparation methods - <i>Masár M., Bodor R.</i> | 1/S | L2,S1,Lw4 | 9 |
| N-mCAL-019 | High performance liquid chromatography - <i>Hutta M., Chalányová M., Góra R., Halko R.</i> | 1/S | L2,S1,Lw4 | 9 |
| N-mCAL-020 | Gas chromatography - <i>Kubinec R., Mračnová R. (UST)</i> | 1/S | L2,S1,Lw4 | 9 |
| N-mCAL-021 | Diploma thesis exercise (1) - <i>KAL</i> | 2/W | Lw12 | 14 |
| N-mCAL-023 | Sampling and sample processing in analytical chemistry - <i>Masár M., Bodor R.</i> | 2/W | L4,S2 | 7 |
| N-mCAL-024 | Seminar from Analytical Chemistry (1) - <i>Hutta M.</i> | 2/W | S2 | 3 |
| N-mCAL-032 | Diploma thesis exercise (2) - <i>KAL</i> | 2/S | Lw20 | 24 |
| N-mCAL-027 | Seminar from Analytical Chemistry (2) - <i>Hutta M.</i> | 2/S | S2 | 3 |

Optional courses

| | | | | |
|------------|--|-----|-------|---|
| N-mCAL-017 | Mass spectrometry in analytical chemistry - <i>Marák J.</i> | 1/W | L2,S2 | 5 |
| N-mCAG-014 | Thermal analysis - <i>Fajnor V.</i> | 1/W | L2 | 3 |
| N-mCAL-008 | Flow injection analysis - <i>Chalányová M., Hutta M.</i> | 1/W | L2 | 3 |
| N-mCAL-039 | Professional experience - <i>Chalányová M.</i> | 1/S | X3t | 3 |
| N-mCAL-025 | Trends in analytical chemistry - <i>Masár M., Hutta M., Marák J., Bodor R., Halko R.</i> | 2/W | L1,S1 | 3 |
| N-mCAL-022 | Nuclear analytical chemistry - <i>Rajec P.</i> | 2/W | L1,S1 | 3 |
| N-mCAL-030 | Special Seminar (1) - <i>KAL</i> | 2/W | S2 | 3 |
| N-mCAL-031 | Special Seminar (2) - <i>KAL</i> | 2/S | S2 | 3 |
| N-mCEC-001 | Chemistry and Environment - <i>Ostrovský I.</i> | 2/W | L2,S1 | 3 |
| N-mCFZ-033 | Programming in chemistry - <i>Neogrády P.</i> | 2/W | P4 | 5 |
| N-mCOR-003 | Stereochemistry of organic compounds - <i>Sališová M.</i> | 2/S | L2,S1 | 4 |

Courses of state tests - mandatory

| | |
|------------|----------------------|
| N-CHAL-0SS | Analytical Chemistry |
| N-CHAL-0SS | Physical Chemistry |

Courses of state tests - compulsory optional courses

| | |
|------------|---------------------|
| N-CHAL-0SS | Inorganic Chemistry |
| N-CHAL-0SS | Biochemistry |
| N-CHAL-0SS | Nuclear Chemistry |
| N-CHAL-0SS | Organic Chemistry |

DOCTORAL STUDY (PhD / 4 years study)**Field of study: 4.1.17 Analytical Chemistry****Study program: Analytical Chemistry**

| | Course title | Semester | Course type | ECTS credits |
|-----|--|-----------------|--------------------|---------------------|
| CC | Dissertation thesis 1 | 1/W | PE | 5 |
| CC | Pedagogical activity 1 | 1/W | PE | 6 |
| CC | Technical English course | 1/W | L/S | 5 |
| COC | Theoretical bases of analytical chemistry 1-5 | 1/W | S | 5 |
| COC | Scientific activity 1 | 1/W | PE | Min.6 |
| OC | Courses 1-7 | 1/W | S | 3 |
| CC | Dissertation thesis 2 | 1/S | PE | 5 |
| CC | Pedagogical activity 2 | 1/S | PE | 6 |
| COC | Theoretical bases of analytical chemistry 1-5 | 1/S | S | 5 |
| COC | Scientific activity 2 | 1/S | PE | Min.11 |
| OC | Courses 1-7 | 1/S | S | 3 |
| CC | Dissertation thesis 3 | 2/W | PE | 5 |
| CC | Pedagogical activity 3 | 2/W | PE | 6 |
| COC | Scientific activity 3 | 2/W | PE | Min.16 |
| OC | Courses 1-7 | 2/W | S | 3 |
| CC | Dissertation thesis 4 | 2/S | PE | 5 |
| CC | Pedagogical activity 4 | 2/S | PE | 6 |
| COC | Scientific activity 4 | 2/S | PE | Min.19 |
| CC | Dissertation examination | 2/S | | 15 |
| CC | Dissertation thesis 5 | 3/W | PE | 5 |
| CC | Pedagogical activity 5 | 3/W | PE | 6 |
| COC | Scientific activity 5 | 3/W | PE | Min.19 |
| CC | Dissertation thesis 6 | 3/S | PE | 30 |
| CC | Dissertation thesis 7 | 4/W | PE | 5 |
| CC | Pedagogical activity 6 | 4/W | PE | 6 |
| COC | Scientific activity 6 | 4/W | PE | 19 |
| CC | Dissertation thesis 8 | 4/S | PE | 30 |

Course 1 Atomic and molecular spectroscopy

Course 2 Chromatographic separation methods

Course 3 Electroseparation methods

Course 4 Methodology of chemical analysis of environmental and biological systems

Course 5 Miniaturized analytical systems

Course 6 Electroanalytical chemistry

Course 7 Chemometry and methodology of experiment

CC - compulsory courses, COC - compulsory optional courses, OC - optional courses, W - winter semester, S - Summer Term, PE - professional experience, L/S - lecture, seminar