2020/21
UNDERGRADUATE ACADEMIC
HANDBOOK

WELCOME, CLASS OF 2024

With your admission to Nazarbayev University you have reached a milestone in your life and in your education. Congratulations!

For those students who progressed into the UG program from NUFYP, you have already spent one year getting to know the CPS faculty and staff, now you will get to know the UG faculty and staff along with NU administration and leadership.

For those of you who have come to us without the Foundation program, welcome, you have begun a new adventure here at NU.

All of you have an exciting four years ahead of you. You will learn new information, acquire new skills and make important decisions.

Work hard, learn lots, make friends and in 2024 graduate with a wonderful memory of NU and take another exciting step in your future.

When you graduate in 2024, you will be joining over 3000 alumni who have gone on and made futures for themselves in graduate schools from Stanford University to MIT to Impe- rial College among many others, along with those who built their futures in leading global companies. We know that you will also find your place at that time and make great futures for yourselves. The NU family welcomes you, and I personally look forward to greeting you on campus.

REBECCA CARTER

University Registrar and
General Director for Student Progress

CONTENT

NU GRADUATES SHALL:

- Possess an in-depth and sophisticated understanding of their domain of study
- Be intellectually agile, curious, creative and open-minded
- Be thoughtful decision-makers who know how to involve others
- Be entrepreneurial, self-propelling and able to create new opportunities
- Be fluent and nuanced communicators across languages and cultures
- Be cultured and tolerant citizens of the world
- Demonstrate high personal integrity
- Be prepared to take a leading role in the development of their country

ACADEMIC CALENDAR

Academic Calendar for Academic Year of 2020-2021 for Undergraduate Students which is posted under Quick Links on https://registrar.nu.edu.kz/

https://registrar.nu.edu.kz/sites/default/files/1%20UG%202020-21_final.pdf

THE OFFICE OF THE REGISTRAR

The Office of the Registrar (OR) supports teaching and learning at NU by maintaining the integrity of academic policies and the student information system. We are the steward of NU student records from application to degree conferral in perpetuity. OR advances student development and learning and empowers students to thrive while at NU.

Website:

https://registrar.nu.edu.kz/

Office hours:

Monday - Friday 8:30 am – 5:30pm
Thursday 1:30 pm – 5:30 pm

Useful Emails:

Student Support Unit - registrar@nu.edu.kz
Registration & Scheduling Unit - schedule-registrar@nu.edu.kz

Location on Campus:

Block 9, Room 9151, 1st floor

ACADEMIC ADVISING UNIT

Academic Advising Unit (AAU) supports students' academic growth and personal development by advising them on degree requirements, academic policies and procedures, major exploration, course selection and study opportunities.

Make an appointment with your advisor if you want to:

- Find out in depth about different degree requirements
- Plan your next semester's schedule
- Get advice on course selection
- Resolve any registration issues
- Consider changing Major/School
- Get support on Academic Warning and Probation cases
- Discuss academic performance
- Get information on policies and procedures at the University and Schools

Website:

http://www.nuaau.cf/

Make an appointment:

http://www.nuaau.cf/make-an-appointment/

Office hours:

Monday - Friday 8:30 am – 6:30 pm
Thursday 2:00 pm – 6:30 pm

ORDERING ACADEMIC DOCUMENTS

Office may provide Academic documents such as enrolment verifications, official transcripts, and degree confirmations upon receiving online request from a student. Each request is processed within 3 working days. During the pandemic, once the document is ready you will receive its scan to your NU email. Hard copy can be mailed via DHL at student's own cost. Delivery details are available here:

https://registrar.nu.edu.kz/announcements/attention-office-registrar-moving-online-updated

To request academic documents, please follow the instructions below or on our website (also includes a video). Instruction on our website are available here:

https://registrar.nu.edu.kz/page/academic-documents

1. Login to MyRegistrar (registrar.nu.edu.kz)
2. Click on "Online ordering Academic documents"
3. Choose the document type you need:

   a) Enrolment verification: this document is usually requested by outside organizations to confirm your student status. It confirms your student status, indicates the date when you were enrolled as a student, and the language of education.

   b) Verification for socially vulnerable students (GCVP): this document is usually requested by ЦОН/ГЦВП to apply for social benefits. Please indicate the exact form/attachment number that you need as it varies depending on the type of social benefit. Types of form/attachments issued by Office are Attachment 2-1, Attachment 4, Attachment 6.

   c) Official transcript
4. Choose the language and quantity of the request
5. Select the Purpose/Destination of the request
6. After selecting required fields, please click "SUBMIT" button

FAQ

1. **What is Academic document?**
   Official transcript, enrolment verification, enrolment verifications for SVC, academic Spravka and more are considered as Academic documents issued by the Office
2. **Can my friend pick up my Academic documents?**
   During the pandemic, once the document is ready you will receive its scan to your NU email. Hard copy can be mailed via DHL at student's own cost. Delivery details are available here. https://registrar.nu.edu.kz/announcements/attention-office-registrar-moving-online-updated
3. **How soon can I collect my Academic documents?**
   It takes up to three working days to prepare Academic documents.
4. **Can I get back my IELTS certificate, which I submitted during the Admission?**
   No, the IELTS certificate is not returned.
5. **Could you state the amount of stipend in my Enrolment verification?**
   No, the information about stipend is provided by the Bursar's Office.
6. **Could you state the language of the instruction (English) in the Academic document?**
   Yes, we do indicate the language of the instruction (English) in Academic documents (official transcripts and enrolment verifications).
7. **Where can I get the enrolment verification for state military department (Form 3)?**
   You need to visit the Department of Student Affairs to get all the required information.

How can I get my High School Diploma (HSD)?

During regular times, students can borrow his/her own HSD only for a certain period of time (up to 10 days). Student is required to leave his/her State ID and/or passport in exchange for HSD. We also can send a scanned copy of your HSD by your e-request to https://registrar@nu.edu.kz However, during pandemic this service is very irregular due to lack of access to campus.

If I have specific questions about Registration or Course withdrawal, whom shall I contact?

For general inquiries, please write to registrar@nu.edu.kz. For specific questions about Schedule, Registration, Retake issues, Transfer of credits, and Transfer between Schools and Majors, please write to https://schedule-registrar@nu.edu.kz

If I change my Personal information details, should I inform the University?

Yes, you have to inform our Office and send all the required documents to https://registrar@nu.edu.kz

COURSE REGISTRATION

NU has an online course registration system. Students shall register for courses in consultation with their academic advisors, and develop a personal schedule in compliance with their degree plans.

IMPORTANT GUIDELINES FOR COURSE REGISTRATION:

- All students have to follow Add/Drop/Withdrawal deadlines. They are indicated in the Academic Calendar on registrar.nu.edu.kz
- In the fall and spring semesters a minimum required course load is 24 ECTS credits, a maximum allowed – 36 ECTS credits. In the summer term a minimum required course load is 2 ECTS credits, a maximum allowed – 16 ECTS credits. Some courses have pre-/co-/anti-requisites. Only students who fulfill these requirements can register for the course. Otherwise, the system will not allow students to register. List of requisites is available under the "Quick links" section on registrar.nu.edu.kz
- Some courses have registration priorities which open registration only for a specific group of students. Priorities are based on School/year of study/major. For students outside of the current priority, such courses will be marked in red in the "Course registration" module. List of priorities is available under the "Quick links" section on registrar.nu.edu.kz.
- It is highly recommended to check all course requirements (requisites and priorities) prior to registration.
- All students must send their schedules to their advisors for approval. Schedules are not considered valid until approved by an academic advisor. For any questions regarding course schedules, please contact your academic advisor.
- There is a Waiting list (WL) option available for those courses which are fully occupied. If the course capacity is full and has a WL, a student can register for the WL the same way as for a regular course. If somebody drops the course, the first student on the WL will be automatically registered for the course. A corresponding email will be sent to the student.

STEP-BY-STEP INSTRUCTIONS

Step 1

Go to registrar.nu.edu.kz -> MyRegistrar (in the upper right corner).

! Do not use your browser's "back" button to navigate through the MyRegistrar system.

Step 2

Enter your Username and Password

If you have any questions concerning your password oruser name, please contact IT Helpdesk at helpdesk@nu.edu.kz

Step 3

Click on 

Course Registration:

The "Course registration" module is where students register for courses online.

For more details, follow the instructions provided in the "How to register for courses online?" https://www.youtube.com/watch?v=99sCFdGT3z4&feature=youtu.be video tutorial.

Additional video tutorials:

How to understand the registration requirements (priorities and requisites)?

https://www.youtube.com/watch?v=jNaVX9aAZwI&feature=youtu.be

How to interpret the notations and terms in the course schedule?

https://www.youtube.com/watch?v=TFx5TiD5AIc&feature=youtu.be

HOW TO SUBMIT ONLINE FORMS

REGISTRATION FORMS. There are several forms available on Undergraduate Students - Forms registrar.nu.edu.kz (https://registrar.nu.edu.kz/page/forms) that will help you during registration.

ADD COURSE FORM is used during the Add period in order to register for the course which is not available for online registration (e.g. instructor›s approval required).

DROP COURSE FORM is used during the Drop period in order to drop the course.

RETAKE PERMISSION FORM is used in order to retake the course which was not failed but graded lower than passing grade.

AUDIT COURSE FORM is used in order to register the course with an «AU» grade. No credits will be awarded.

EXTRA PLACE FORM is used in case if a student is given permission forextra place in an over loaded class.

PRIORITY OVERRIDE FORM allows a student to register for the course where he/she is not listed on the priority requirements.

REQUISITE OVERRIDE FORM is used in case if a student is given permission to register for the course with out there quired requisite(s).

CHANGE OF KAZAKH LEVEL FORM is used for changing a student's level in the Kazakh language.

COURSE OVERLOAD FORM isused in case if the number of registered credits is higher than the allowed maximum ECTS credits per semester/term. This is provided in exceptional cases only.

COURSE UNDERLOAD FORM is used if the number of registered credits is lower than the required minimum ECTS credits per semester/term. Thisis provided in exceptional cases only.

Students can initiate a request for course registration forms through the Students Request module on my Registrar. For instructions, please refer to the User Manual.

FAQ

1. **Where can I find general schedule with list of sections, instructors and time slots?**
registrar.nu.edu.kz -> Course schedule by Schools https://registrar.nu.edu.kz/course-schedules
2. **Where can I find course requirements and registration priorities?**
registrar.nu.edu.kz -> Course list with requirements https://registrar.nu.edu.kz/course-requirements
3. **What courses should I take?**
Consult with your advisor and refer to the relevant section of this Handbook on course requirements by Schools.
4. **What should I do if I have time conflicts between courses required for my major and minor?**
NU does not provide any priority for double major/minor requirement courses. Given that minor declarationis optional, it is the student's responsibility to build their schedule based on major and minor requirements.
5. **Why is registration for some of the Kazakh language courses closed for me?**
Registration for the Kazakh language courses is based on student's language level verified by the Kazakh language department at SSH. For any questions, please contact the Kazakh language department.
6. **When should I click the "Send to advisor" button?**
Clickonthe "Send to advisor" button only if your schedule is complete. Please note that your our schedule has to be approved until the end of Add period.
7. **I've made my schedule and sent an approval request to advisor. What is next?**
Please wait–when your schedule is approved/rejected, you will receive an automatic not ification by email. If you don't receive any email, please contact your advisor.
8. **What should I do if my request was denied?**
Make adjustments in your schedule taking into consideration the rejection statement from your advisor.
9. **What if I want to change my schedule after advisor's approval?**
Contact your advisor to remove a hold from your registration.
10. **What is the last day of Add/Drop period?**
All dates and deadlines are listed in Academic Calendar.
11. **Can I add the course after Add period?**
No courses can be added after Add period.
12. **Can I drop the course after Drop period?**
After Drop period there is a With drawal period when dropping the course is called With drawal. It differs from the simple drop since it records a "W" note in your tran script, how ever the with drawal has no impact on your GPA. Note: number of registered credits remaining after with draw al should be noless than 24 ECTS other wise permission for a course underload is required.

The following Common Grading Scale is applied to all NU undergraduate programs:

Letter	%	Quality points	Explanation
A	95-100	4.00	Excellent; exceeds the highest standards in the assignment for course.
A-	90-94.9	3.67	Excellent; meets the highest standards for the assignment or course.
B+	85-89.9	3.33	Very good; meets high standards for the assignment or course.
B	80-84.9	3.00	Good; meets most of the standards for the assignment or course.
B-	75-79.9	2.67	More than adequate; shows some reasonable command of the material.
C+	70-74.9	2.33	Acceptable; meets basic standards for the assignment or course.
C	65-69.9	2.00	Acceptable; meets some of the basic standards for the assignment or course.
C-	60-64.9	1.67	Acceptable, while falling short of meeting basic standards in several ways.
D+	55-59.9	1.33	Minimally acceptable; falling short of meeting many basic standards.
D	50-54.9	1.00	Minimally acceptable; lowest passing grade.
F	0-49.9	0.00	Failing, very poor performance

Special administrative grades and notations are used on transcripts, which apply to all University programs. The administrative notations in Table 2 do not affect the calculation of either the GPA **or the CGPA:**

AU	Audit
AW	Administrative Withdrawal
I	Incomplete
IP	In Progress
TC	Transfer Credit
W	Withdrawal

GPA calculation.

The Cumulative GPA (CGPA) is computed by dividing the total cumulative grade points by the total graded credits attempted for courses taken in residence at NU. Grade points are calculated by multiplying the number of credits by the numeric value of the grade for each course. The sum of the grade points is then divided by the total graded credits attempted. The total graded credits attempted, not the credits earned toward graduation, are used in computing the GPA.

Grade appeals.

All students have the right to appeal any grade that they believe is in error. The error must be based on one of the following criteria:

1) error in calculation;
2) error in application of the class grade policy as presented in the Course Syllabus;
3) incorrect entry of the grade into the database;
4) incomplete marking of an assessment.

Appeal process for exam grade.

1) A student must first consult with the course instructor within 3 (three) working days of the receipt of the contested grade.
2) The course instructor has 3 (three) working days in which to address the concern and file a Change of Grade if needed, or deny the request.
3) If a student is still dissatisfied, he or she may appeal to the Dean or Vice Dean of the relevant School within 3 (three) working days upon the receipt of the denial from the course instructor.
4) The Dean or Vice Dean shall consult with the instructor before making any decision. The decision of the Dean or Vice Dean shall be final.

Mid-semester reports.

Mid-semester status reports and other provisional grades are not permanent and changes will not be accepted.
Mid-semester status reports are required from all course instructors in all courses to help University to identify and assist students who may need additional academic guidance.

Mid-semester grading will be based on the following system:

1) Satisfactory (S) – a student who is at a minimum C or above with excellent attendance.
2) Non-Satisfactory (NS) – a student who is at a C- or below with attendance problems and other issues that may keep the student from successfully completing the courses.

ACADEMIC STANDING

To continue in any UG program at University, a student must be in Good Academic Standing at the conclusion of Fall and Spring semesters excluding Summer term.

Good Academic Standing

A student having a CGPA and GPA of a 2.00 or above is considered to be in Good Academic Standing.

Academic Warning

A student with 3 (three) or more NS grades is placed on Academic Warning after the mid-term status reports are submitted. This status warns them that they are at risk of being placed on academic probation at the end of the semester. Notification of Academic Warning will be sent by the Office to the student, the School's Vice Dean and the student's advisor.

The student will be advised to limitt heir social activities during this period and may not be considered for University sponsored travel.

Academic Probation

A student who fails to satisfy conditions for Good Academic Standing at the end of Fall and Spring semesters, will be placed on Academic Probation. At the end of one semester of Academic Probation, students are subject to dismissal from University if they have not achieved the necessary conditions as stated above to return to Good Academic Standing.

In exceptional cases, the Dean of the relevant School may recommend to extend an Academic Probation for a second semester based on the evidence of improvement, overall academic progress, and the student's potential to return to Good Academic Standing and eventually to graduate on time.

This recommendation must be submitted to the VPAA indicating the grounds for the recommendation. The final decision on extension of the Academic Probation for another semester is made by the VPAA.

Students who are progressed on a conditional basis are required to achieve a GPA of 2.00 or above during their first semester as a student. If a conditionally progressed student fails to achieve a 2.00 GPA in their first semester, the first semester will automatically be adjusted to read as "1st probation", thereby placing them on "2nd probation" in their second semester.

Conditionally progressed students who fail to achieve and maintain a CGPA of 2.00 or above in their first year are subject to dismissal.

Limit to Consecutive Semesters on Academic Probation. Under no circumstances may a student be on Academic Probation more than 2 (two) consecutive semesters or for more than 3 (three) semesters in total.

TRANSFER BETWEEN SCHOOLS AND MAJORS

After entering NU, students may discover that their first choice of major does not correspond to their interests or intellectual abilities. Those students may seek to change their degree. NU supports these decisions by allowing internal transfers between undergraduate Schools.

- Transfer will go into effect in the following semester after approval of the application;
- Check with the School you wish to transfer to for more information. Each School will have its own transfer requirements.
- An internal transfer student will only be accepted for transfer based on space availability and at the discretion of the Receiving School.

Transfer procedure.

Fill in the Transfer form (available on registrar.nu.edu.kz), collect the required signatures and submit it to the School office.

- Transfer decisions are primarily based on the applicant's eligibility, academic performance, English language proficiency, and the ability to complete the chosen program within the allotted time.

Double major.

A double major is a program of study that meets the requirements of two distinct majors in a single Bachelor's degree. A double major may only consist of two fields of study within the same School. Only one program will be considered as primary.

Double majors and minors do not provide priorities for registration. Double major and minor declaration forms are available on registrar.nu.edu.kz.

OTHER

Final examinations.

- All scheduled final examinations or equivalent final graded exercises are held at the end of the semester during the NU's official final examination period.
- No student shall have more than two scheduled final examinations in one day. In case there are more than two final examinations scheduled in one day or two final examinations are scheduled at the same time, the student should first contact instructors of the courses for assistance in resolving conflicts. If the problem still cannot be resolved, the student should contact the Dean of the School.

Class Attendance.

- Students are expected to attend all classes. Each instructor is responsible for his/her attendance policy, subject to the requirements of NU regulations and School attendance policies. Each instructor determines the relationship between class attendance, the objectives of the class and the student's grade.
- The instructor is responsible for informing students of attendance policies and the effect of attendance on their grade during one of the first two class sessions. Students are responsible for knowing the policy for each course. Only the instructor can approve student's request to be absent from class. Violation of the instructor's attendance policy may result in lowered grades or in an instructor-initiated withdrawal from the course. In the event of a dispute, the matter may be reported to the University Disciplinary Council.

Student Code of Conduct.

The file can be found in https://nu.edu.kz/wp-content/uploads/2017/11/NU-Student-Code-of-Conduct.pdf (the main NU website), so maybe it is better just to put the link?

https://nu.edu.kz/wp-content/uploads/2017/11/NU-Student-Code-of-Conduct.pdf

The information on **Leave of Absence and Withdrawal** is available on https://registrar.nu.edu.kz/page/academic-leave in Policies and Procedures section.

CORE CURRICULUM

UNDERGRADUATE CORE CURRICULUM FRAMEWORK (UCCF)

The UCCF was designed to create common curricular elements that unite to deliver a common educational experience to all NU students, leaving an indelible NU brand and ensuring all of our undergraduates develop the knowledge, skills and attributes that will position them for future success.

PROGRAM AIMS

1. Broaden the academic experience of NU undergraduate students;
2. Encourage the development of the NU Graduate Attributes, and inter- disciplinary thinking and skills through shared experiences;
3. Conform to the accreditation requirements of NU undergraduate fields of study.

THE CORE CURRICULUM LEARNING OUTCOMES

1. Upon successful completion of the Core Curriculum, students will be able to:
2. Communicate fluently in the English Language;
3. Demonstrate competence in the Kazakh Language;
4. Describe and interpret major events in Kazakh and Kazakhstani history;
5. Demonstrate knowledge of the natural and social sciences;
6. Apply numerical and digital literacy skills;
7. Apply skills in business, design and entrepreneurial thinking;
8. Use research skills and methods to complete projects;
9. Identify ethical and leadership issues and take appropriate actions.

UNDERGRADUATE CORE CURRICULUM FRAMEWORK

Learning Outcome	Graduate Attribute(s)	Course(s)*	Number
1. Communicate fluently in the English Language	5. Be fluent and nuanced communicators across languages and cultures.	Composition & Rhetoric Discipline Specific Composition Communications WCS 150 - Rhetoric and Composition, WCS 202 - Communication OR Second Year Writing Course from a list designed for broad disciplines (e.g. Technical Communication; Science Writing; Creative Writing; Multi-Modal Composition; Advanced Academic Writing) The Writing Across the Curriculum Program will provide support for each program to incorporate writing intensive courses of their own design at upper levels	2
2. Demonstrate competence in the Kazakh Language	5. Be fluent and nuanced communicators across languages and cultures.	KAZ Courses, as appropriate by level. Every student must pass two courses (12 ECTS minimum) of KAZ, and attainment of proficiency	2

3. Describe and interpret major events in Kazakh and Kazakhstani history	6. Be cultured and tolerant citizens of the world.	HST 100 - History of Kazakhstan	1
4. Demonstrate knowledge of the natural and social sciences	2. Be intellectually agile, curious, creative and open-minded.	Any Course in SOC, PLS, ANT, or ECON	1
		Any course from PHYS, BIO, CHEM, GEOLOGY	1
5. Apply numerical ad digital literacy skills	2. Be intellectually agile, curious, creative and open-minded. 8. Be prepared to take a leading role in the development of their country.	Any MATH course (6 ECTS in order to be consistent with SEDS and SMG requirements)	1
		Any CSCI course OR SEDS programming course	1
6. Apply skills in business, design and entrepreneurial thinking	3. Be thoughtful decision makers who know how to involve others. 4. Be entrepreneurial, self-propelling and able to create new opportunities.	BUS 101 Core course in Business	1
7. Use research skills and methods to complete projects	5. Possess an in-depth and sophisticated understanding of their domain of study. 6. Be in tellectually agile, curious, creative and open-minded.	SSH (PLS 210, SOC 201, WLL 273) SEDS (BENG 343, BENG 384, ECHE 384, ECHE 385,...) SSH (BIOL 355, BIOL 456, CHEM 380, PHYS 395, CSCI 307, ...)	1
8. Identify ethical and leadership issues and take appropriate leadership actions	7. Demonstrate high personal integrity. 8. Be prepared to take a leading role in the development of their country.	Applied Ethics and Leadership courses in PHIL - to include guest lectures from all Schools. Alternatives: selected Political Science Courses OR Applied Ethics courses from Schools (e.g. Medical Ethics, Bioethics, Business Ethics, Professional Ethics)	1
Total number of courses and credits: 12 x 6 ECTS			=72 ECTS
N.B. Each core course will be 6 ECTS to ensure consistency across all programs.			

DEGREE REQUIREMENTS

To graduate with a Bachelor's degree within the four-year scholarship award, students are required to **earn a minimum of 240 ECTS** or as designated by each School.

Degree program requirements are usually updated every year, and may include changes. These updates are published once a year in the handbook or on the School website. Students are required to follow the requirements that are in place in the handbook at the time they officially declare a major. If the degree requirements change after a student officially declares a major, the student is not affected by the change unless that change makes it simpler for the student to graduate.

See below the requirements for all NU undergraduate programs. Please note that these requirements may be subject to minor changes upon decision of the Schools.

The Undergraduate Core Curriculum Framework has been incorporated into these programs. Students study a minimum of 240 ECTS over the whole program. For the specific requirements see the degree programs below.

SCHOOL OF SCIENCES AND HUMANITIES

- BA in Anthropology
- BA in Economics
- BA in History
- BA in Sociology
- BA in Political Science and International Relations
- BA in World Languages, Literature and Cultures
- BSc in Biological Sciences
- BSc in Chemistry
- BSc in Mathematics
- BSc in Physics

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

- BEng in Civil and Environmental Engineering
- BEng in Electrical and Computer Engineering
- BEng in Chemical and Materials Engineering
- BEng in Mechanical and Aerospace Engineering
- BSc in Computer Science
- BSc in Robotics and Mechatronics

SCHOOL OF MINING AND GEOSCIENCES

- BSin Mining Engineering
- BS in Petroleum Engineering
- BS in Geology

SCHOOL OF MEDICINE

- BS in Nursing
- BSc in Medical Sciences

SCHOOL OF SCIENCES AND HUMANITIES

MAJOR DECLARATION and CONFIRMATION

All first year students in SSH declare their major only after they completed the first two semesters. All students of Sciences are accepted under their preferred major (Chemistry, Biological Sciences, Mathematics and Physics). After the progression audit at the end of the Spring students will be confirmed in their major. Students who don't pass the progression audit will be given two options:

1. to retake courses in summer
2. to be come undeclared/change the irmajor

Students who choose Option 1 and successfully pass re-taken courses at the end of the summer term will be confirmed in their major. Students who choose Option 1 and again fail to meet the progression requirements will have the options of changing to a different major, to Undeclared, or withdraw/be dismissed from the University.

If a student plans to major in **Economics** he/she must complete 3 following courses with a grade of **"B-"**or above in each course:

1. ECON 101 Introduction to Microeconomics
2. ECON 102 Introduction to Macroeconomics
3. MATH 161 Calculus I

The students are allowed only one retake in ECON 101 and/or ECON 102. In addition, the students MUST satisfy the GPA requirement of a minimum of 2.75 after two academic terms.

If student plans to major in **Political Science and International Relations**, he/she must pass **one of these following** courses with a grade of **"C"** or above by end of Spring semester:

1. PLS120 Introduction to Political Theory
2. PLS140 Introduction to Comparative Politics
3. PLS150 Introduction to International Relations

If a student plans to major in **Sociology/Anthropology**, he/she must pass at least one course in Sociology/Anthropology major (any-thing that starts with abbreviation SOC/ANT) with a grade of **"C"**or above by end of Spring semester

If a student plans to major in **History** no special requirements are required.

If a student plans to major in **World Languages, Literature and Culture**, he/she must pass at least one WLL or LING course with a grade of **"C-"** or above for courses taken in Fall'20 and "C" or above for courses taken in Spring'21 by end of Spring semester.

If a student plans to major in **Biological Sciences**, they must complete the following five courses with a grade of **"C"** or above in each course by the end of Summer term:

1. BIOL 110 Modern Biology I
2. BIOL 110L Modern Biology I Laboratory
3. CHEM 102 General Chemistry II
4. CHEM 101L General Chemistry I Laboratory
5. MATH 161 Calculus I

If a student plans to major in **Chemistry**, they must complete the following two courses with a grade of **"C"** or above in each course by the end of Summer term:

- CHEM 102 General Chemistry II

If a student plans to major in **Mathematics**, they must earn a **minimum GPA 3.0** in

- MATH 161 Calculus I
- MATH 162 Calculus II

If a student plans to major in **Physics**, they must complete the following three courses with a grade of **"C-"** or above in each course by the end of Summer term:

- PHYS 162 Physics II for Scientists and Engineers with Laboratory
- MATH 162 Calculus II
- CSCI 151 Programming for Scientists and Engineers

BA IN ANTHROPOLOGY

Anthropology Requirements	Credits	Explanation
Elementary Courses	18	Choice of any three courses from: ANT 101, ANT 140, ANT 160, ANT 175, or ANT 181
Methods Courses	12	SOC 201 Social Science Research Methods - mandatory Choice of: ANT 214/SOC 214 Qualitative Research Methods in Anthropology and Sociology ANT 240 Laboratory Methods in Archaeology
Theory Course	6	Choice of: ANT 306 Anthropology of Performance ANT 385 Postcolonial Theory and its Applications in Eurasia SOC 301 Classical Sociological Theory
Intermediate/Advanced Electives	24	Any four ANT electives at 200 or 300 or 400-level, where at least one course is in a different sub-field number range (i.e., X00-X29, X30-X49, X50-X74, X75-X99).
Senior Capstone	12	ANT 498 and ANT 499
Total Major Credits	**72**	
CORE REQUIREMENTS		
History of Kazakhstan	6	HST 100
Kazakh	12	Two KAZ courses
Ethics	6	One Ethics course (PHIL 210, 211 or 212)
Writing & Communication	12	WCS 150 Rhetoric and Composition and 200-level writing or communication course (any WCS 200-level)
Other Humanities	24	Four Non-major Humanities electives (any courses from HST, WLL, LING, REL, PHIL and any foreign language course)
Other Social Sciences	18	Three Non-major Social Science electives (any SOC, PLS, ECON courses)
Computer Science	6	One CSCI course
Math	6	One MATH course
Natural Science	6	One Natural Science elective (BIOL, CHEM, PHYS, GEOL)
Business	6	One Business course (BUS 101 Core Course in Business)
Electives	66	Any courses from SSH, SEDS, SMG or SOM
Total Degree Credits	**240**	

Recommended First-Year Schedule
For Anthropology

	Fall	ECTS	Spring	ECTS
Year 1	WCS 150 Rhetoric and Composition or HST 100 History of Kazakhstan	6	WCS 150 Rhetoric and Composition or HST 100 History of Kazakhstan	6
	ANT 101, ANT 140, ANT 160, or ANT 175	6	ANT 101, ANT 140, ANT 160, or ANT 175	6
	SOC 201 Social Science Research Methods	6	Core Curriculum course: Math, CSCI or Natural Science Elective	6 or 8
	Humanities Elective	6	Kazakh language	6
	General elective	6	General elective	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30 or 32**

Major Declaration: If you plan to major in Anthropology please see here

Requirements for Minor in Anthropology

COURSE REQUIREMENTS FOR AN ANTHROPOLOGY MINOR	
Elementary Courses	Any two 100-level from ANT 101, ANT 140, ANT 160, ANT 175, or ANT 181 12 ECTS Intermediate/ Advanced Courses 12 ECT
6 credits of Theory (Anthropology of Performance OR Postcolonial Theory and its Applications in Eurasia OR Classical Sociological Theory); At least one course at the intermediate or advanced level in any subfield	
Anthropology Electives	No more than one course may be at the 100-level, 12 ECTS
Total Credits	**36**

BA IN ECONOMICS

Economics Requirements	Credits	Description
Elementary Courses	18	ECON 101 Introduction to Microeconomics ECON 102 Introduction to Macroeconomics ECON 211 Economic Statistics
Intermediate Courses	18	ECON 201 Intermediate Microeconomics ECON 202 Intermediate Macroeconomics ECON 301 Econometrics I
General Economics Electives	24	Four 300-level Economics electives
Advanced Economics Electives	18	Three 400-level Economics electives
Total Major Credits	78	
CORE REQUIREMENTS		
History of Kazakhstan	6	HST 100
Kazakh	12	Two KAZ courses
Ethics	6	One Ethics course (PHIL 210, 211 or 212)
Writing & Communication	12	WCS 150 Rhetoric and Composition and 200-level writing or communication course (any WCS 200-level)
Other Humanities	24	Four Non-major Humanities electives (any courses from HST, WLL, LING, REL, PHIL and any foreign language course)
Other Social Sciences	18	Three Non-major Social Science electives (any SOC, PLS, ANT courses)
Computer Science	6	One CSCI course
Math	8	MATH 161 Calculus I
Natural Science	6	One Natural Science elective (BIOL, CHEM, PHYS, GEOL)
Business	6	One Business course (BUS 101 Core Course in Business)
Electives	58	Any courses from SSH, SEDS, SMG or SOM
Total Degree Credits	**240**	

Recommended First-Year Schedule
For Economics

	Fall	ECTS	Spring	ECTS
Year 1	WCS 150Rhetoric and Composition **or** HST 100 History of Kazakhstan	6	WCS 150 Rhetoric and Composition or HST 100 History of Kazakhstan	6
	ECON 101 Introduction to Microeconomics **or** ECON 102 Introduction to Macroeconomics	6	ECON 101 Introduction to Microeconomics or ECON 102 Introduction to Macroeconomics	6
	Humanities elective	6	MATH 161 Calculus I	8
	Social Science elective	6	Kazakh language	6
	General elective	6	General elective	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**32**

Major Declaration: If you plan to major in Economics please see here

Requirements for Minor in Economics

COURSE REQUIREMENTS FOR AN ECONOMICS MINOR	
Elementary Courses	6 credits Introduction to Microeconomics 6 credits Introduction to Macroeconomics *, 12 ECTS
Intermediate Courses	6 credits Intermediate Microeconomics 6 credits Intermediate Macroeconomics 6 credits Econometrics I **, 18 ECTS
Any 300 or 400 level Economics Courses	12 ECTS
Total credits	**42**

*The passing grade for Introduction to Microeconomics and Introduction to Macroeconomics must be a minimum of B-.
** The combination of MATH 321 Probability and MATH 322 Mathematical Statistics/MATH 310 Applied Statistical Methods is counted as prerequisite for Econometrics I.

BA IN HISTORY

History Requirements	Credits	Description
Elementary Courses	12	Two 100-level History electives
General History Electives	6	One History elective
Intermediate/Advanced	30	Two 200 or 300 or 400-level History electives Two 300 or 400-level History electives One 400-level History elective
Research Methods	6	HST 274/ WLL 274
Senior Capstone	12	HST 498 and HST497 or HST 499
Total Major Credits	66	
Core Requirements		
History of Kazakhstan	6	HST 100
Kazakh	12	Two KAZ courses
Ethics	6	One Ethics course (PHIL 210, 211 or 212)
Writing & Communication	12	WCS 150 Rhetoric and Composition and 200-level writing or communication course (any WCS 200-level)
Other Humanities	24	Four Non-major Humanities electives (any courses from WLL, LING, REL, PHIL and any foreign language course)
Other Social Sciences	18	Three Non-major Social Science electives (any SOC, PLS, ECON or ANT courses)
Computer Science	6	One CSCI course
Math	6	One MATH course
Natural Science	6	One Natural Science elective (BIOL, CHEM, PHYS, GEOL)
Business	6	One Business course (BUS 101 Core Course in Business)
Electives	72	Any courses from SSH, SEDS, SMG or SOM
Total Degree Credits	**240**	

Recommended First-Year Schedule
For History

	Fall	ECTS	Spring	ECTS
Year 1	WCS 150 Rhetoric and Composition **or** HST 100 History of Kazakhstan	6	WCS 150 Rhetoric and Composition **or** HST 100 History of Kazakhstan	6
	Major Course (100-level History elective)	6	Major Course (100-level History elective)	6
	Social Science Elective	6	Humanities or Social Science elective	6
	Humanities Elective	6	Kazakh language	6
	General elective	6	General elective	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

Major Declaration: If you plan to major in History please see here

Requirements for Minor in History

COURSE REQUIREMENTS FOR AN HISTORY MINOR	
Elementary Courses	Any two courses at the 100 level not including HST 100, 12 ECTS
Intermediate and/ or Advanced Courses	30 ECTS
Total credits	**42**

BA IN POLITICAL SCIENCE & INTERNATIONAL RELATIONS (PSIR)

PSIR Requirements	Credits	Description
Introductory Courses	18	PLS 120 Introduction to Political Theory PLS 140 Introduction to Comparative Politics PLS 150 Introduction to International Relations
Methods Courses	12	PLS 210 Political Science Research Methods PLS 211 Quantitative Methods for Political Science
PSIR Electives	42	Seven 200, 300, or 400-level PLS electives, with at least three at the 300 and two at the 400 level
Total Major Credits	72	
Core Requirements		
History of Kazakhstan	6	HST 100
Kazakh	12	Two KAZ courses
Ethics	6	One Ethics course (PHIL 210, 211 or 212)
Writing & Communication	12	WCS 150 Rhetoric and Composition and 200-level writing or communication course (any WCS 200-level)
Other Humanities	24	Four Non-major Humanities electives (any courses from HST, WLL, LING, REL, PHIL and any foreign language course)
Other Social Sciences	18	Three Non-major Social Science electives (any SOC, ANT, ECON courses)
Computer Science	6	One CSCI course
Math	6	One MATH course
Natural Science	6	One Natural Science elective (BIOL, CHEM, PHYS, GEOL)
Business	6	One Business course (BUS 101 Core Course in Business)
Electives	66	Any courses from SSH, SEDS, SMG or SOM
Total Degree Credits	**240**	

Recommended First-Year Schedule
For Political Science and International Relations

	Fall	ECTS	Spring	ECTS
Year 1	WCS 150 Rhetoric and Composition **or** HST 100 History of Kazakhstan	6	WCS 150 Rhetoric and Composition **or** HST 100 History of Kazakhstan	6
	Introductory PSIR courses: PLS 120, PLS 140 or PLS 150	6	Introductory PSIR courses: PLS 120, PLS 140 or PLS 150	6
	Humanities elective	6	Introductory PSIR courses: PLS 120, PLS 140 or PLS 150	6
	Social Science elective	6	Kazakh language	6
	General elective	6	General elective	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

Major Declaration: If you plan to major in PSIR please see here

Requirements for Minor in Political Science and International Relations

COURSE REQUIREMENTS FOR A PSIR MINOR	
Elementary Courses	Two introductory courses from the following: PLS 120 Introduction to Political Theory PLS 140 Introduction to Comparative Politics PLS 150 Introduction to International Relations 12 ECTS
Intermediate and/ or Advanced Courses	Any additional PLS courses. At least one course must be 300 level or higher, 18 ECTS
Methods	PLS 210 Political Science Research Methods or PLS 211 Quantitative Methods in Political Science 6 ECTS
Total credits	**36**

BA IN SOCIOLOGY

Sociology Requirements	Credits	Description
Elementary Course	6	SOC 101 Introduction to Sociology
Methods Courses	18	SOC 201 Social Science Research Methods SOC 203 Quantitative Methods in Sociology SOC 214 Qualitative Methods in Sociology
Theory Course	6	SOC 301 Classical Sociological Theory
Sociology Elective	6	One SOC elective
Intermediate/ Advanced Courses	24	Two 200 or 300 or 400-level SOC electives Two 300 or 400-level SOC electives
Senior Capstone	12	SOC 498 and SOC 499
Total Major Credits	72	
Core Requirements		
History of Kazakhstan	6	HST 100
Kazakh	12	Two KAZ courses
Ethics	6	One Ethics course (PHIL 210, 211 or 212)
Writing & Communication	12	WCS 150 Rhetoric and Composition and 200-level writing or communication course (any WCS 200-level)
Other Humanities	24	Four Non-major Humanities electives (any courses from HST, WLL, LING, REL, PHIL and any foreign language course)
Other Social Sciences	18	Three Non-major Social Science electives (any ANT, ECON, PSIR courses)
Computer Science	6	One CSCI course
Math	6	One MATH course
Natural Science	6	One Natural Science elective (BIOL, CHEM, PHYS, GEOL)
Business	6	One Business course (BUS 101 Core Course in Business)
Electives	66	Any courses from SSH, SEDS, SMG or SOM
Total Degree Credits	**240**	

Recommended First-Year Schedule For Sociology

	Fall	ECTS	Spring	ECTS
Year 1	WCS 150 Rhetoric and Composition **or** HST 100 History of Kazakhstan	6	WCS 150 Rhetoric and Composition **or** HST 100 History of Kazakhstan	6
	SOC 101 Introduction to Sociology	6	Humanities Elective/ Social Science Elective or 200-Level Writing or Communication course	6
	SOC 201 Social Science Research Methods	6	Math, Computer Science or Natural Science Elective	6 or 8
	Humanities Elective	6	Kazakh language	6
	General elective	6	General elective	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30 or 32**

Major Declaration: If you plan to major in Sociology please see here

Requirements for Minor in Sociology

COURSE REQUIREMENTS FOR A SOCIOLOGY DEGREE MINOR	
Elementary Courses	Introduction to Sociology, 6 ECTS
Intermediate/Advanced Courses	Classical Sociological Theory (required) Social Sciences Research Methods (required), 30 ECTS
Total credits	**36**

BA IN WORLD LANGUAGES, LITERATURES AND CULTURES

WLC Requirements	Credits	Description
Elementary Course	6	Any WLL or LING course at 100-level
Research Methods	6	WLL 273/HST 273 OR LING 273 OR LING 274
Intermediate Courses	12	Two WLL or LING courses at 200-level OR Two language courses (201/202)
Advanced Courses	12	Two courses at 300 or 400-level
WLL Electives	24	Any WLL, LING or Language courses
Senior Capstone	12	WLL 498 and WLL 499
Total Major Credits	72	
Core Requirements		
History of Kazakhstan	6	HST 100
Kazakh	12	Two KAZ courses
Ethics	6	One Ethics course (PHIL 210, 211 or 212)
Writing & Communication Math	12	WCS 150 Rhetoric and Composition and 200-level writing or communication course (any WCS 200-level)
Other Humanities	24	Four Non-major Humanities electives (any courses from HST, REL or PHIL)
Other Social Sciences	18	Three Non-major Social Science electives (any ANT, SOC, PLS, ECON courses)
Computer Science	6	One CSCI course
Math	6	One MATH course
Natural Science	6	One Natural Science elective (BIOL, CHEM, PHYS, GEOL)
Business	6	One Business course (BUS 101 Core Course in Business)
Electives	66	Any courses from SSH, SEDS, SMG or SOM
Total Degree Credits	**240**	

Recommended First-Year Schedule
For World Languages, Literatures and Cultures

	Fall	ECTS	Spring	ECTS
Year 1	WCS 150 Rhetoric and Composition **or** HST 100 History of Kazakhstan	6	WCS 150 Rhetoric and Composition or HST 100 History of Kazakhstan	6
	WLL 110 Introduction to Literary Studies or LING 131 Introduction to Linguistics	6	WLL 110 Introduction to Literary Studies or LING 131 Introduction to Linguistics	6
	Language elective	8	Language elective	8
	Social Science elective	6	Kazakh language	6
	General elective	6	Math course or Computer Science elective	6
	Total semester ECTS credits	**32**	**Total semester ECTS credits**	**32**

Major Declaration: If you plan to major in World Languages, Literatures and Cultures please see here

Requirements for Minor in World Languages, Literatures and Cultures

COURSE REQUIREMENTS IN WORLD LANGUAGES, LITERATURE AND CULTURES MINOR	
Elementary	Any WLL or LING 100-level course (Foreign Language courses do not count), 6 ECTS
Advanced Courses	Two courses at the Advanced Level (WLL or LING 300/400-level), 12 ECTS
Electives	Any WLL or LING 200-level courses, including Foreign Language (minimum 201), 18 ECTS
Total credits	**36**

COURSE REQUIREMENT FOR A SPANISH & HISPANIC STUDIES MINOR	
SPA 202 Intermediate Spanish II Language requirement	SPA 202 - Intermediate-2 level, 8 ECTS
SPA 314 Advanced Spanish Grammar and Composition	Obligatory completion of SPA 314 course, 6 ECTS
Intermediate/Advanced Content Spanish Courses	At least one 300-level course taught in Spanish, 6 ECTS
Electives	Any WLL or LING 200-level courses or 300/400-level courses, 16 ECTS
Total credits	**36**

COURSE REQUIREMENT FOR A FRENCH & FRANCOPHONE STUDIES MINOR	
FRE 202 Intermediate French II	FRE 202 - Intermediate-2 level, 8 ECTS
Topics in French and Francophone Studies	Completion of Intro to French & Francophone Studies, 6 ECTS
Intermediate/Advanced Content French Courses	At least one 300-level course taught in French, 6 ECTS
Electives	Any WLL or LING 200-level, 300-level or 400-level courses, 16 ECTS
Total credits	**36**

COURSE REQUIREMENT FOR A PHILOSOPHY AND RELIGIOUS STUDIES MINOR	
Philosophy Course	One course in each of Philosophy, 6 ECTS
Religious Studies	Religious Studies at any level, 6 ECTS
Philosophy or Religious Studies Advanced Courses	A minimum of 12 credits at the 300 level or above, 12 ECTS
Electives	12 ECTS
Total credits	**36**

BSc IN BIOLOGICAL SCIENCES

		Course Abbr.	Course Title	ECTS
NU Undergraduate Core Curriculum Framework required courses		HST 100	History of Kazakhstan	6
		KAZ	Kazakh language	12
		WCS 150	Rhetoric and Composition	6
		WCS 200-level	Any 200-level writing course.	6
		SOC, PLS, ANT, or ECON	Any SOC, PLS, ANT, or ECON course.	6
		MATH 161	Calculus I	8
		PHYS 161	Physics I for Scientists and Engineers with Laboratory	8
		CSCI	Any CSCI course except CSCI 100 and CSCI 101	8
		BIOL 355	BIOL 355 Critical Research Reasoning	6
		Business	Any business course	6
		BIOL 321	Bioethics	6
		Subtotal credits		**78**
Major required courses	Discipline core courses	CHEM 101	General Chemistry I	6
		CHEM 102	General Chemistry II	6
		CHEM 101L	General Chemistry I Laboratory	2
		CHEM 211	Organic Chemistry I	6
		CHEM 211L	Organic Chemistry I Laboratory	2
		CHEM 212 and CHEM 212L, or PHYS 162, or MATH 162	Organic Chemistry II Laboratory and CHEM 212L Organic Chemistry II Laboratory, or Physics II for Scientist and Engineers with Laboratory, or Calculus II	8
		MATH 310	Applied Statistical Methods	6
		BIOL 105	General Biology	6
		BIOL 110	Modern Biology I	6
		BIOL 110L	Modern Biology I Laboratory	2
		BIOL 120	Modern Biology II	6
		BIOL 120L	Modern Biology II Laboratory	2
		BIOL 230	Human Anatomy and Physiology I	6
		BIOL 341 or CHEM 341	Biochemistry I	6
	Major electives	BIOL 301	Molecular Cell Biology	6
		BIOL 305	Introduction to Microbiology	6
		BIOL 305L	Introduction to Microbiology Laboratory	2
		BIOL 370	Genetics	6
		BIOL 310	Immunology	6
		Subtotal credits		**96**
		BIOL 300-/400-level	Any 300- and 400-level BIOL courses except BIOL 399 Biology Internship and BIOL 392 Directed Study in Biology. At least three courses must be taken at 400-level.	36
		Subtotal credits		**132**
Technical electives		Non-BIOL courses	Any letter-grade (A-F) courses outside Biological Sciences with one course at 300-level or higher.	18
General electives		Any NU courses	Any NU 100- to 400-level courses.	12
Total credits				240

BIOL 456 Biology Research Design in combination with BIOL 492 Directed Study in Biology fulfills the 12 ECTS research experience requirement.

Minor in Biological Sciences

No.	Course code	Course title	Requisites	ECTS
Minor required courses				
1	BIOL 110	Modern Biology I	N/A	6
2	BIOL 110L	Modern Biology I Laboratory	BIOL 110	2
3	BIOL 120	Modern Biology II	BIOL 110	6
4	BIOL 120L	Modern Biology II Laboratory	BIOL 120	2
5	BIOL 230	Human Anatomy and Physiology I	BIOL 110	6
6	BIOL 331	Human Anatomy and Physiology II	BIOL 230	6
7	BIOL 331L	Human Anatomy and Physiology II Laboratory	BIOL 331	2
8	BIOL 301	Molecular Cell Biology **or**	BIOL 120	6
	BIOL 305	Introduction to Microbiology	BIOL 120	
Subtotal				**36**
Minor elective course - any 2 courses (12 ECTS)				
1	BIOL 320	Developmental Biology	BIOL 230	6
2	BIOL 301L	Molecular Cell Biology Laboratory	BIOL 301	2
4	BIOL 333	Environmental Biology	BIOL 120	6
5	BIOL 340	Bioinformatics with Laboratory	BIOL 120, MATH 310	8
6	BIOL 341 or CHEM 341	Biochemistry I	CHEM 211, BIOL 120	6
7	BIOL 341L or CHEM 341L	Biochemistry I Laboratory	BIOL 341, CHEM 341	2
8	BIOL 352	Biology of Cancer	BIOL 301	6
9	BIOL 363	Structural Bioinformatics with Laboratory	BIOL 341 or CHEM 341 or CSCI 235	8
10	BIOL 380	The Biology of Behavior	BIOL 230	6
11	BIOL 385	Cell Signaling: principles and mechanisms	BIOL 120	6
12	BIOL 418	Molecular Biology of the Gene	BIOL 301	6
13	BIOL 440	Neuroscience	BIOL 230	6
14	BIOL 430	Histology with Laboratory	BIOL 230	8
15	BIOL 445	Medical Microbiology	BIOL 305	6
16	BIOL 450	Food Microbiology	BIOL 305	6
17	BIOL 468	Integrated Cell Biology	BIOL 120	6
18	BIOL 470	Advanced Cell Biology	BIOL 301, (BIOL 341 OR CHEM 341)	6
19	BIOL 471	Light and Electron Microscopy Concepts and Techniques	BIOL 120 or CHEM 101 or PHYS 161	6
20	BIOL 471L	Light and Electron Microscopy Concepts and Techniques Laboratory	BIOL 471	2
21	BIOL 480	Molecular Immunology	(BIOL 341 or CHEM 341), BIOL 310	6
22	BIOL 488	The Biology of Aging	BIOL 301	6
Minimum number of credits (ECTS) for a Minor in Biological Sciences				48

Recommended Schedule for Biology students

	Fall	ECTS	Spring	ECTS
Year 1	BIOL 105 General Biology	6	CHEM 102 General Chemistry II	6
	CHEM 101 General Chemistry I	6	CHEM 101L General Chemistry I Laboratory	2
	Computer Science course: CSCI 115, CSCI 111 or CSCI 151	8	BIOL 110 Modern Biology I	6
	MATH 161 Calculus I	8	BIOL 110L Modern Biology I Laboratory	2
	HST 100 History of Kazakhstan or WCS 150 Rhetoric and Composition	6	PHYS 161 Physics I for Scientists and Engineers with Lab	8
			Kazakh language	**6**
	Totalsemester ECTScredits	**34**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 2	CHEM 211 Organic Chemistry I	6	BIOL 341 or CHEM 341 Biochemistry I	6
	CHEM 211 L Organic Chemistry I Laboratory	2	BIOL 230 Human Anatomy and Physiology I	6
	MATH 310 Applied Statistical Methods	6	PHYS 162 Physics II for Scientists and Engineers with Laboratory or CHEM 211 Organic Chemistry II and CHEM 211L Organic Chemistry II Laboratory or MATH 162 Calculus II	8
	BIOL 120 Modern Biology II	6	200-level writing or communication course: WSC 202, WCS 230, WCS 225	6
	BIOL 120 L Modern Biology II Laboratory	2		
	WSC 150 Rhetoric and Composition	6		
	Kazakh language	6		
	Total semester ECTS credits	**34**	**Total semester ECTS credits**	**26**

	Fall	ECTS	Spring	ECTS
Year 3	BIOL 370 Genetics	6	BIOL 301 Molecular Cell Biology	6
	BIOL 305 Introduction to Microbiology	6	BIOL 310 Immunology	6
	BIOL 305 L Introduction to Microbiology Laboratory	2	BIOL 321 Bioethics	6
	BUS 101 Core Course in Business	6	Social Science elective (any SOC, PLS, ANT, or ECON course)	6
	BIOL 355 Critical Research Reasoning	6	Major Elective 2	6
	Major Elective 1	6		
	Total semester ECTS credits	**32**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 4	Major Elective 3 (BIOL 456 Biology Research Design) or Honors Thesis Research (BIOL 490)	6 (0)	Major Elective 6 (BIOL 492 Directed Study in Biology) or Honors Thesis (BIOL 491)	6 (18)
	Major Elective 4	6	Technical Elective 3	6
	Major Elective 5	6	General Elective 1	6
	Technical Elective 1	6	General Elective 2	6
	Technical Elective 2	6		
	Total semester ECTS credits	**30 (24)**	**Total semester ECTS credits**	**24 (36)**
			Total ECTS credits	240

BSC in CHEMISTRY

	Course Abbr.	Course Title	ECTS
NU Undergraduate Core Curriculum Framework required courses	HST 100	History of Kazakhstan	6
	KAZ	Kazakh language	12
	WCS 150	Rhetoric and Composition	6
	WCS 200-level	Any 200-level writing course.	6
	Social Science elective	Any SOC, PLS, ANT, or ECON course.	6
	MATH 161	Calculus I	8
	PHYS 161	Physics I for Scientists and Engineers with Laboratory	8
	CSCI	Any CSCI course	8
	CHEM 380	Research Methods	6
	BUS 101	Core Course in Business	6
	PHIL 210	Ethics	6
	Subtotal credits		**78**
Major required courses	**Physics and mathematics requirements (14 ECTS)**	MATH 162Calculus II	14
		MATH 274 Intro To Differential Equations	
	Core chemistry courses (96 ECTS)	CHEM101 General Chemistry I (6 ECTS)	96
		CHEM101L General Chemistry Lab (2 ECTS)	
		CHEM102 General Chemistry I (6 ECTS)	
		CHEM 211 Organic Chemistry I (6 ECTS)	
		CHEM 211L Organic Chemistry I Laboratory (2 ECTS)	
		CHEM 212 Organic Chemistry II (6 ECTS)	
		CHEM 212L Organic Chemistry II Lab (2 ECTS)	
		CHEM 220 Quantitative Chemical Analysis (6 ECTS)	
		CHEM 220L Quantitative Chemical Analysis Lab (2 ECTS)	
		CHEM 250 Descriptive Inorganic Chemistry (6 ECTS)	
		CHEM 320 Instrumental Analysis (6 ECTS)	
		CHEM 320L Instrumental Analysis Lab (2 ECTS)	
		CHEM 331 Physical Chemistry I (6 ECTS)	
		CHEM 331L Physical Chemistry I Lab (2 ECTS)	
		CHEM 332 Physical Chemistry II (6 ECTS)	
		CHEM 332L Physical Chemistry II Lab (2 ECTS)	
		CHEM 341 Biochemistry I (6 ECTS)	
		CHEM 341L Biochemistry I Lab (2 ECTS)	
		CHEM 350 Advanced Inorganic Chemistry (6 ECTS)	
		CHEM 350L Advanced Inorganic Chemistry Lab (2 ECTS)	
		CHEM 488 Directed Research I (6 ECTS)	
		CHEM 489 Directed Research II (6 ECTS)	
	Chemistry electives (24 ECTS)	CHEM 410 Structural Spectroscopy (6 ECTS)	24
		CHEM 411 Advanced Organic Chemistry I (6 ECTS)	
		CHEM 412 Advanced Organic Chemistry II (6 ECTS)	
		CHEM 431 Computational Chemistry (6 ECTS)	
		CHEM 432 Introduction to Cheminformatics and Computer-Based Drug Design (6 ECTS)	
		CHEM 442 Biochemistry II (6 ECTS)	
		CHEM 451 Applied Homogeneous Catalysis (6 ECTS)	
		CHEM 471 Environmental Chemistry (6 ECTS)	
		CHEM 490 Nanochemistry (6 ECTS)	
		CHEM 493 Honors Thesis Research (6 ECTS)*	
		CHEM 494 Honors Thesis (6 ECTS)*	
		* The Honors Thesis Research and Honors Thesis courses will be offered only when a Honors degree framework will be established	
Technical electives		Technical electives include any SEDS, ECON, SMG, PHYS, MATH or BIOL course. At least one technical elective course must be at 300 level or above.	18
General electives		General electives can be any letter (A-F) course at 100 level and above offered at NU.	12
Total credits			242

Minor in Chemistry

MINOR IN CHEMISTRY (48 ECTS)		
1	CHEM101	General Chemistry I (6 ECTS)
2	CHEM 101L	General Chemistry I Lab (2 ECTS)
3	CHEM102	General Chemistry II (6 ECTS)
4	CHEM211	Organic Chemistry I (6 ECTS)
5	CHEM 211L	Organic Chemistry I Lab (2 ECTS)
6	CHEM212	Organic Chemistry II (6 ECTS)
7	CHEM 212L	Organic Chemistry II Lab (2 ECTS)
8	CHEM 220	CHEM 220 Quantitative Chemical Analysis (6 ECTS)
9	CHEM 250	Descriptive Inorganic Chemistry (6 ECTS)
10	CHEM 331 or CHEM 341	Physical Chemistry I (6 ECTS) or Biochemistry I (6 ECTS)

Recommended Schedule for Chemistry students

	Fall	ECTS	Spring	ECTS
Year 1	CHEM 101 General Chemistry	6	CHEM 102 General Chemistry II	6
	CHEM 101L General Chemistry I Lab	2	Kazakh Language	6
	Core curriculum course (WCS 150, HST 100, Kazakh language course or any CSCI 100-level course)	8	MATH 162 Calculus II	8
	MATH 161 Calculus I	8	Core curriculum course (WCS 150, HST 100, Kazakh language course or any CSCI 100-level course)	6
	Core curriculum course (WCS 150, HST 100, Kazakh language course or any CSCI 100-level course)	6	Core curriculum course (WCS 150, HST 100, Kazakh language course or any CSCI 100-level course)	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**32**

	Fall	ECTS	Spring	ECTS
Year 2	PHYS 161 Physics I for Scientists and Engineers with Lab	8	Any 200-level writing course	6
	CHEM 211 Organic Chemistry I	6	CHEM 212 Organic Chemistry II	6
	CHEM 211L Organic Chemistry I Laboratory	2	CHEM 212L Organic Chemistry I Lab	2
	CHEM 220 Quantitative Chemical Analysis	6	MATH 274 Intro To Diff. Equations	6
	CHEM 220L Quantitative Chemical Analysis Lab	2	Technical Elective 1	6
	Ethics or Bioethics course (PHIL 210 or BIOL 420/PHIL 215)	6	CHEM 250 Descriptive Inorganic Chemistry	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**32**

	Fall	ECTS	Spring	ECTS
Year 3	CHEM 331 Physical Chemistry I	6	CHEM 320 Instrumental Analysis	6
	CHEM 331L Physical Chemistry I Lab	2	CHEM 320L Instrumental Analysis Lab	6
	CHEM 341 Biochemistry I	6	CHEM 332 Physical Chemistry II	2
	CHEM 341L Biochemistry I Lab	2	CHEM 332L Physical Chemistry II Lab	6
	One of SOC, PLS ANT or ECON courses	6	CHEM 350 Adv. Inorganic Chemistry	2
	BUS 101 Core Course in Business	6	CHEM 350L Adv. Inorganic Chem. Lab	6
	CHEM 380 Research Methods	6	General Elective 1	2
	Total semester ECTS credits	**34**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 4	CHEM 488 Directed Research I	6	CHEM 489 Directed Research II	6
	CHEM 4XX Major Elective 1	6	CHEM 4XX Major Elective 2	6
	Technical Elective 2	6	CHEM 4XX Major Elective 3	6
	Technical Elective 3	6	CHEM 4XX Major Elective 4	6
	General Elective 2	6		
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**24**
			Total ECTS credits	242

BSC in MATHEMATICS

Major Core	MATH 162 Calculus II	8
	MATH 251 Discrete Mathematics	6
	MATH 263 Calculus III	8
	MATH 273 Linear Algebra with Applications	8
	MATH 274 Introduction to Differential Equations	6
	MATH 302 Abstract Algebra I	6
	MATH 321 Probability	6
	MATH 322 Mathematical Statistics	6
	MATH 351 Numerical Methods	6
	MATH 361 Real Analysis I	6
	MATH 496 Capstone Project 1 or MATH 498 Capstone Honors Project 1	6
	MATH 497 Capstone Project 2 or MATH 499 Capstone Honors Project 2	6
Major Electives	Any Math 300- or 400-level courses. At least 24 ECTS must be from 400-level courses	42
	Subtotal	**120**
NU Undergraduate Core Curriculum Framework required courses	Kazakh Language	12
	Ethics	6
	HST 100 History of Kazakhstan	6
	WCS 150, one 200-level writing course	12
	Research Method (MATH 350)	6
	Social Science (SOC, PLS, ANT, or ECON)	6
	Natural Science (PHYS, CHEM, BIO, or GEOLOGY)	8
	Math (MATH 161)	8
	Computer Programming (Any CSCI course or Programming course)	8
	Business	6
	Subtotal	**78**
Technical Electives	A technical elective is a course taken in the following : BIOL, CHEM, ECON, PHYS, SEDS, SMG (One technical elective must be 300-level or above	**18**
General Electives	In addition to the requirements above, students must take any courses offered at NU to reach the total 240 ECTS requirement.	
	Total	240

Minor in Mathematics

The minor in Mathematics consists of at least eight courses, out of which four are required and four are elective courses.

Required:

MATH 161 Calculus I

MATH 162 Calculus II

MATH 263 Calculus III

MATH 273 Linear Algebra with Applications Elective:

At least four electives, with two from among MATH 251, 274, 321, 322, 351, and 361 and two at the 4xx level.

*All courses must be passed with C or better

Recommended Schedule for Mathematics students

	Fall	ECTS	Spring	ECTS
Year 1	MATH 161 Calculus I	8	MATH 162 Calculus II	8
	Natural Science (Any course from PHYS, BIOL, CHEM, GEOL)	8	Technical elective 1	6
	Core curriculum course (WCS 150, HST 100, Kazakh language course or any CSCI 100-level course)	8	Core curriculum course (WCS 150, HST 100, Kazakh language course or any CSCI 100-level course)	6
	Core curriculum course (WCS 150, HST 100, Kazakh language course or any CSCI 100-level course)	6	Core curriculum course (WCS 150, HST 100, Kazakh language course or any CSCI 100-level course)	6
			Social Science (Any course SOC, PLS, ANT, or ECON)	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**32**

	Fall	ECTS	Spring	ECTS
Year 2	MATH 263 Calculus III	8	MATH 274 Introduction to Differential Equations	6
	MATH 273 Linear Algebra with Applications	8	MATH 321 Probability	6
	MATH 251 Discrete Mathematics	6	PHIL 210 Ethics	6
	Kazakh Language	6	200-level Writing or Communication course	6
			Technical Elective 2	6
	Total semester ECTS credits	**28**	**Total semester ECTS credits**	**30**

Year 3	Fall	ECTS	Spring	ECTS
	Two courses from MATH 302, 322, 351, 361	6	Two courses from MATH 302, 322, 351, 361	6
		6		6
	Major elective 1	6	Major elective 3	6
	Major elective 2	6	Major elective 4	6
	BUS 101 Core Course in Business	6	Research Methods (MATH 350)	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

Year 4	Fall	ECTS	Spring	ECTS
	MATH 496 Capstone Project 1 or MATH 498 Capstone Honors Project 1	6	MATH 497 Capstone Project 1 or MATH 499 Capstone Honors	6
	Major Elective 5	6	General Elective 2	6
	Major Elective 6	6	General Elective 3	6
	Major Elective 7	6	General Elective 4	6
	General Elective 1	6	Technical Elective 3	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**
			Total ECTS credits	240

BSC in PHYSICS

UG Core Curriculum Framework Courses, at least 72 ECTS	ECTS
Physics I for Scientists and Engineers with Laboratory (PHYS 161)	8
Calculus I (MATH161)	8
Programming for Scientists and Engineers (CSCI 151)	8
Research Methods (PHYS 395)	6
History of Kazakhstan (HST 100)	6
2 courses of Kazakh Language, Literature or Culture (KAZ)	12
Rhetoric and Composition (WCS 150)	6
200-level Writing course	6
Choose one course from SOC, PLS, ANT or ECON	6
Business fundamentals and Entrepreneurship	6
Applied Ethics course from School	6
Total	**78**
Physics Core Physics Courses	ECTS
Physics II for Scientists and Engineers with Laboratory (PHYS162)	8
Classical Mechanics I (PHYS 221)	6
Classical Mechanics II (PHYS 222)	6
Modern Physics with Laboratory (PHYS 261)	8
Computational Physics with Laboratory (PHYS 270)	6
Thermodynamics and Statistical Physics (PHYS 280)	6
Mathematical Methods of Physics (PHYS 315)	6
Classical Electrodynamics I (PHYS 361)	6
Classical Electrodynamics II (PHYS 362)	6
Optics with Laboratory (PHYS 370)	8
Quantum Mechanics I (PHYS 451)	6
Quantum Mechanics II (PHYS 452)	6
Total	**78**
Physics Core Mathematics Courses	ECTS
Calculus II (MATH 162)	8
Calculus III (MATH 263)	8
Linear Algebra with Applications (MATH 273)	8
Introduction to Differential Equations (MATH 274)	6
Total	**30**

Major Electives, including at least three PHYS courses of 400 level and at least two designated research courses (399, 465, 474, 491), total 24 ECTS credits:

Elective Courses offered by Physics Department	ECTS
Introductory Astronomy I (PHYS 201)	6
Introductory Astrophysics (PHYS 202)	6
Introduction to Quantum Technologies (PHYS 291)	6
Research project and internship (PHYS 299)	6
Physics Research Project (PHYS 399, designated research course)	6
Advanced Mathematical Physics (PHYS 411)	6
Introduction to Biophysics (PHYS 433)	6
Introduction to Chemical Physics (PHYS 443)	6
Introduction to Particle Physics (PHYS 453)	6
Astrophysics and General Relativity (PHYS 463)	6
Advanced Experimental Physics (PHYS 465, designated research course)	6
Introduction to Solid State Physics (PHYS 473)	6
Lasers and Photonics (PHYS 474, designated research course)	6
Topics in Material Science (PHYS 476)	6
Statistical Mechanics (PHYS 483)	6
Directed Study of Advanced Physics Topics (PHYS 491, designated research course)	6
Physics Colloquium (PHYS 495)	0
Technical Electives: BIOL, ECON, CHEM, MATH, SEDS, SMG, including at least one course at the 300-level, total 18 ECTS credits;	18
General electives: In addition to the requirements above, students must take any courses offered at NU	12
Total ECTS	240

Minor in Physics

Minor in Physics track requires to complete five Minor-required (36 ECTS) and two Minor-elective courses (12 ECTS).

Minor-required courses include:

Physics I (PHYS 161, 8 ECTS)
Physics II (PHYS 162, 8 ECTS)
Classical Mechanics I (PHYS 221, 6 ECTS)
Modern Physics with Laboratory (PHYS 261, 8 ECTS)
Thermodynamics and Statistical Physics (PHYS 280, 6 ECTS).
Minor-elective courses (12 ECTS): any Physics courses

Recommended Schedule for Physics students

	Fall	ECTS	Spring	ECTS
Year 1	PHYS 161 Physics for Scientists and Engineers I with Laboratory	8	PHYS 162 Physics for Scientists and Engineers II with Laboratory	8
	MATH 161 Calculus I	8	MATH 162 Calculus II	8
	CSCI 151 Programming for Scientists and Engineers	8	MATH 273 Linear Algebra with Applications	8
	HST 100 History of Kazakhstan or WCS 150 Rhetoric and Composition	6	HST 100 History of Kazakhstan or WCS 150 Rhetoric and Composition	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 2	PHYS 221 Classical Mechanics I	6	PHYS 222 Classical Mechanics II	6
	PHYS 261 Modern Physics with Laboratory	8	PHYS 280 Thermodynamics and Statistical Physics	6
	MATH 263 Calculus III	8	PHYS 270 Computational Physics with Laboratory	6
	MATH 274 Introduction to Differential Equations	6	200 – level Writing course or Communication course	6
			General Elective 1	6
	Total semester ECTS credits	**28**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 3	PHYS 361 Classical Electrodynamics I	6	PHYS 362 Classical Electrodynamics II	6
	PHYS 315 Mathematical Method in Physics	6	PHYS 451 Quantum Mechanics I	6
	Kazakh Language	6	PHYS 370 Optics with Laboratory	8
	PHYS 395 Research Methods in Physics	6	Social Science Elective (SOC, PLS, ANT, or ECON)	6
	Major Elective 1, Level 400	6	Major Elective 2, Level 400	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**32**

	Fall	ECTS	Spring	ECTS
Year 4	PHYS 452 Quantum Mechanics II	6	Ethics	6
	Kazakh Language	6	BUS 101 Core Course in Business	6
	Major Elective 3	6	Major Elective 4	6
	Technical Elective 1	6	Technical Elective 3	6
	Technical Elective 2	6	General Elective 2	6
	PHYS 498 Honors Thesis Research	0*	PHYS 499 Honors Thesis	6*
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

* not counted in the total

Total ECTS credits	240

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

The School of Engineering and Digital Sciences offers six full-time undergraduate programs, which are BSc in Civil and Environmental Engineering, BSc in Electrical and Computer Engineering, BSc in Chemical and Materials Engineering, BSc in Mechanical and Aerospace Engineering, BSc in Computer Sciences and BSc in Robotics and Mechatronics. The Undergraduate Core Curriculum Frame work has been incorporated into these programs. Although most of the elective courses are developed and taught in the School of Engineering and Digital Sciences, courses from other Schools may be considered as electives after the approval process in the School. For the specific requirements see the degree programs below.

BEng IN CIVIL AND ENVIRONMENTAL ENGINEERING (CEE)

	Fall	ECTS	Spring	ECTS
Year 1	MATH 161 Calculus I	8	MATH 162 Calculus II	8
	PHYS 161 Physics I for Scientists and Engineers with Laboratory	8	PHYS 162 Physics II for Scientists and Engineers with Laboratory	8
	ENG 100 Introduction to Engineering	6	ENG 102 Engineering Materials I	6
	ENG 101 Programming for Engineers	6	Kazakh Language	6
	WCS 150 Rhetoric and Composition	6	HST 100 History of Kazakhstan	6
	Total semester ECTS credits	**34**	**Total semester ECTS credits**	**34**

	Fall	ECTS	Spring	ECTS
Year 2	ENG 200 Differential Equations & Linear Algebra	6	WCS 210 Technical Writing	6
	Ethics (PHIL 210, 211, OR 212)	6	ENG 201 Applied Probability and Statistics	6
	CEE 200 or MAE 200 Structural Mechanics I	6	ENG 202 Numerical Methods in Engineering	6
	CEE 204 Civil Engineering CAD and Surveying	6	CEE 203 Structural Analysis	6
	CEE 201 Environmental Chemistry	6	CEE 202 Environmental Engineering	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 3	ECON 323 Managerial Economics	6	BUS 101 Core Course in Business	6
	CEE 300 Structural Design - Concrete	6	CEE 301 Structural Design – Steel	6
	CEE 302 Geotechnical Engineering	6	CEE 303 Geotechnical Design	6
	CEE 304 Fluid Mechanics I	6	CEE 305 Hydraulics and Hydrology	6
	CEE 306 Civil Engineering Materials	6	Elective 1 or ENG 300 Interdisciplinary Design Project (IDP)	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 4	ENG 400 Capstone Project I	6	ENG 400 Capstone Project II	6
	Kazakh Language	6	CEE 401 Construction Technology and Management	6
	CEE 400 Transportation Engineering	6	Elective 4	6
	Elective 2	6	Elective 5	6
	Elective 3	6	Elective 6	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**
			Total ECTS credits	248

CIVIL AND ENVIRONMENTAL ENGINEERING ELECTIVE COURSES

Students should choose elective courses on the basis of primary and secondary areas among Structural Engineering, Geotechnical Engineering, Environmental Engineering, Water Resources Engineering, Construction Engineering and Management, and Transportation Engineering. Elective courses could be changed time to time to address the industry demand and the faculty expertise.

The full elective courses based on the discipline are listed below:

Structural Engineering

- CEE 450 Behavior and Design of Structural System
- CEE 451 Prestressed Concrete Design
- CEE 452 Advanced Structural Mechanics

Geotechnical Engineering

- CEE 453 Applied Soil Mechanics
- CEE 454 Foundation Engineering

Environmental Engineering

- CEE 350 Water & Waste water Treatment Processes
- CEE 455 Solid and Hazardous Waste Management
- EE 456 Membrane Separation Processes
- CEE 457 Air Quality Management

Construction Engineering and Management

- CEE 351 Application of Geomatics in Civil Engineering
- CEE 458 Modern Information Technology in Construction

Water Resources Engineering

- CEE 459 Water Systems and Structures
- CEE 460 Water Supply and Distribution Management

Transportation Engineering

- CEE 352 Structure and Properties of Concrete Materials
- CEE 461 Traffic Engineering and Management
- CEE 462 Pavement Design and Performance

Student who wants to conduct research can choose the following courses:

- CEE 463 Individual Research Project in Civil Engineering I
- CEE 464 Individual Research Project in Civil Engineering II

BEng IN ELECTRICAL AND COMPUTER ENGINEERING (ELCE)

	Fall	ECTS	Spring	ECTS
Year 1	ENG 100 Introduction to Engineering	6	ENG 103 Engineering Materials II	6
	MATH 161 Calculus I	8	MATH 162 Calculus II	8
	PHYS 161 Physics I for Scientists and Engineers with Laboratory	8	PHYS 162 Physics II for Scientists and Engineers with Laboratory	8
	ENG 101 Programming for Engineers	6	Kazakh Language	6
	WCS 150 Rhetoric and Composition	6	HST 100 History of Kazakhstan	6
	Total semester ECTS credits	**34**	**Total semester ECTS credits**	**34**

	Fall	ECTS	Spring	ECTS
Year 2	ENG 200 Differential Equations and Linear Algebra	6	ENG 201 Applied Probability and Statistics	6
	ELCE 200 Circuit Theory I	6	ELCE 201 Circuit Theory II	6
	ELCE 2XX/MATH 251 Discrete Mathematics	6	ELCE 201L Circuit Theory Laboratory	2
	Ethics (PHIL 210, 211, OR 212)	6	WCS 210 Technical Writing	6
	ELCE 203 Signals and Systems	6	ELCE 202 Digital Logic Design	6
	ELCE 203L Signals and Systems Laboratory	2	ELCE 202L Digital Logic Design Laboratory	2
	Total semester ECTS credits	**32**	**Total semester ECTS credits**	**28**

	Fall	ECTS	Spring	ECTS
Year 3	ELCE 301 Electronic Circuits	6	ELCE 300 Microprocessor Systems	6
	ELCE 301L Electronic Circuits Laboratory	2	ELCE 300L Microprocessor Systems Laboratory	2
	ELCE 204 Solid State Devices or ELCE 304 Computer Networks	6	Interdisciplinary Design Project (IDP) or Independent Study	6
	ECE Specialization Laboratories	4	ECE Specialization Laboratories	4
	ELCE 306 Linear Control Theory or ELCE 307 Digital Signal Processing	6	ELCE Power Systems Analysis or ELCE 308 Communication Systems	6
	Kazakh Language	6	ELCE 302 Electical Machines and Drives or ELCE 305 Data Structures and Algorithms	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 4	ENG 400 Capstone Project	6	ENG 400 Capstone Project	6
	Social Science Elective (SOC, PLS, ANT, ECON)	6	Business Fundamentals and Entrepreneurship	6
	Discipline Elective 1	6	Discipline Elective 4	6
	Discipline Elective 2	6	Discipline Elective 5	6
	Discipline Elective 3	6	Natural Science Elective	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**
			Total ECTS credits	248

Devices and Circuits	Power Systems	Signal Processing and Communications Systems	Computer Engineering
Mixed Signal Circuits	Power Amplifier and Wireless Transmit- ter Circuits	Digital Communications	Reconfigurable Computing and FPGAs
Digital Image Processing	Advanced Digital Signal Processing	Data Communications	Computer Networks
Analog Integrated Circuits	Power Electronics	Numerical Optimization Techniques for Engineers	Operating Systems
Digital Integrated Circuits	Power Transmission and Distribution Systems	Optical fiber communications	Parallel Computer Architecture
VLSI Design	High Voltage Engineering	Fundamentals of Photonics	System identification and control
MOS Device Modelling	Power System Protection	Digital Image Processing	Introduction to Computational Intelligence
Introduction to Computational Intelligence	Advanced Power System Analysis	Data Analytics	Modeling and Simulation
Logic Synthesis	Electric Power Generation	Introduction to Stochastic Modeling	Database Systems
RF Circuit Design	Industrial Electric Machinery	Advanced Digital Signal Processing	Introduction to Stochastic Modeling
RF Integrated Circuits	Microprocessor Systems	RF Circuit Design	Performance Evaluation of Computer Networks and Systems
High Frequency Electronic Devices	Computer Networks	RF Integrated Circuits	Wireless Networks
Digital Communications	Data Analytics	High Frequency Electronic Devices	Wireless Sensor Networks
Data Analytics	Numerical Optimization Techniques for Engineers	Wireless Sensor Networks	Introduction to Cybersecurity
Optical sensors and biosensors	Introduction to Cybersecurity	Wireless Networks	Data Analytics
Internship and Coop	Internship and Coop	Internship and Coop	Internship and Coop
Independent Study	Independent Study	Independent Study	Independent Study
Special Topics in ECE	Special Topics in ECE	Special Topics in ECE	Special Topics in ECE
	System identification and control		Wireless Networks

BEng IN CHEMICAL AND MATERIALS ENGINEERING (CHME)

	Fall	ECTS	Spring	ECTS
Year 1	MATH 161 Calculus I	8	MATH 162 Calculus II	8
	PHYS 161 Physics I for Scientists and Engineers with Laboratory	8	ENG 103 Engineering Materials II	6
	ENG 101 Programming for Engineers	6	PHYS 162 Physics II for Scientists and Engineers with Laboratory	8
	ENG 100 Introduction to Engineering	6	WCS 150 Rhetoric and Composition	6
	HST 100 History of Kazakhstan	6	Kazakh Language	6
	Total semester ECTS credits	**34**	**Total semester ECTS credits**	**34**

	Fall	ECTS	Spring	ECTS
Year 2	CHME 200 Basic Principles and Calculations in Chemical Engineering	6	Ethics (PHIL 210, 211, OR 212)	6
	ENG 200 Differential Equations and Linear Algebra	6	ENG 202 Numerical Methods in Engineering	6
	CHME 222 Inorganic and Analytical Chemistry	6	ENG 201 Applied Probability and Statistics	6
	CHME 201 Chemical Engineering Thermodynamics	6	CHME 202 Fluid Mechanics	6
	WCS 210 Technical Writing	6	CHME 203 Organic and Polymer Chemistry	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 3	BUS 101 Core Course in Business	6	ECON 323 Managerial Economics	6
	CHME 302 Instrumental Methods of Analysis for Engineers	6	CHME 303 Separation Processes	6
	CHME 300 Heat and Mass Transfer	6	CHME 304 Chemical Reaction Engineering	6
	CHME 301 Applied Mathematics for Process Design	6	CHME 305 Chemical Engineering Lab 1	6
	Elective 1	6	ENG 301 Interdisciplinary Design Project (ENG 300 IDP) or Research Practice	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 4	ENG 400 Capstone Project	6	ENG 400 Capstone Project	6
	CHME 400 Process Design and Simulation	6	CHME 402 Materials Chemistry	6
	CHME 401 Chemical Engineering Lab 2	6	CHME 403 Chemical Process Control and Safety	6
	Kazakh Language	6	Elective 3	6
	Elective 2	6	Elective 4	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**
			Total ECTS credits	248

CHEMICAL AND MATERIALS ENGINEERING
ELECTIVE COURSES

Students should choose 4 elective courses (24ECTS) based on their interest. Elective courses could be changed time to time to address the industry demand and the faculty expertise. The program is enriched by an extensive variety of elective courses related to both Chemical Engineering and Materials Engineering. Depth and Breadth elective courses are indicated by (D) and (B), respectively.

The full elective courses based on the discipline are listed below:

Chemical Engineering courses:

- CHME 450 Atmospheric Chemistry and Physics (D)
- CHME 351 Environment and Development (B)
- CHME 352 Process Design for Environmental Applications (B)
- CHME 451 Advanced Process Simulation (D)
- CHME 452 Industrial Waste water Treatment and Reclamation (D)
- CHME 453 Multiphase Systems (D)
- CHME 454 Advanced Transport Phenomena (D)
- CHME 455 Heterogeneous Reactor Engineering (D)
- CHME 456 Colloids and Surface Science (D)
- CHME 457 Advanced Chemical Process Safety and Risk Modeling (D)

Materials Engineering courses:

- CHME 353 Electrochemical Engineering (B)
- CHME 458 Corrosion Protection in Oiland Gas Industry (D)
- CHME 459 Biomechanics (D)
- CHME 421 Tissue Engineering (B)
- CHME 460 Polymer Processing and Rheology (D)
- CHME 461 Powder Technology (D)

BEng IN MECHANICAL AND AEROSPACE ENGINEERING (MAE)

	Fall	ECTS	Spring	ECTS
Year 1	MATH 161 Calculus I	8	MATH 162 Calculus II	8
	PHYS 161 Physics I for Scientists and Engineers with Laboratory	8	PHYS 162 Physics II for Scientists and Engineers with Laboratory	8
	ENG 100 Introduction to Engineering	6	ENG 102 Engineering Materials I	6
	ENG 101 Programming for Engineers	6	Kazakh Language	6
	HST 100 History of Kazakhstan	6	WCS 150 Rhetoric and Composition	6
	Total semester ECTS credits	**34**	**Total semester ECTS credits**	**34**

	Fall	ECTS	Spring	ECTS
Year 2	MAE 200 Structural Mechanics I	6	MAE 206 Engineering Dynamics I	6
	CEE 201 Environmental Chemistry	6	MAE 205 Materials and Manufacturing I	6
	MAE 201 Computer Aided Design	6	ENG 201 Applied Probability and Statistics	6
	ENG 200 Engineering Mathematics III (Differential Equations & Linear Algebra)	6	ENG 202 Numerical Methods in Engineering	6
	WCS210 Technical Writing	6	Ethcs (PHIL 210, 211, OR 212)	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 3	MAE 300 Fluid Mechanics I	6	MAE 305 Fluid Mechanics II	6
	MAE 301 Engineering Thermodynamics	6	MAE 307 Engineering Dynamics II	6
	MAE 302 Machine Elements Design	6	MAE 306 Computer Aided Engineering	6
	MAE 303 Control Systems	6	ECON 323 Managerial Economics	6
	Fundamentals of Entrepreneurship and Management	6	Elective 1	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 4	ENG 400 Capstone Project	6	ENG 400 Capstone Project	6
	MAE 400 Heat Transfer	6	Elective 3	6
	MAE 401 Mechanical Systems Design	6	Elective 4	6
	Kazakh Language	6	Elective 5	6
	Elective 2	6	Elective 6	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**
			Total ECTS credits	248

MECHANICAL AND AEROSPACE ENGINEERING ELECTIVE COURSES

Students should choose 6 elective courses on the basis of primary and secondary areas among Materials and Manufacturing, Aerospace Engineering, Thermofluids and Energy Applications, System Dynamics and Control, Design and Analysis. Elective courses could be changed time to time to address the industry demand and the faculty expertise.

Materials and Manufacturing

- Structural Mechanics II
- Materials and Manufacturing II

Aerospace Engineering

- Vehicle Propulsion Systems
- Aerodynamics
- Flight Mechanics

Thermofluids and Energy Applications

- Heating Ventilating & Air-Conditioning
- Fire Engineering
- Feasibility Analysis of Clean Energy Technologies
- Advanced Heat Transfer

System Dynamics and Control

- Oscillations of Mechanical Systems
- Fundamentals of Multi-Body Dynamics
- Advanced Control Systems and Industrial Automation

Design and Analysis

- Computer Aided Geometric Design
- Advanced Topics in Computational Fluid Dynamics

Interdisciplinary Project – IDP

BSc IN COMPUTER SCIENCE

	Fall	ECTS	Spring	ECTS
Year 1	MATH 161 Calculus I	8	MATH 162 Calculus II	8
	PHYS 161 Physics for Scientists and Engineers I with Laboratory	8	PHYS 162 Physics for Scientists and Engineers II with Laboratory	8
	CSCI 151 Programming for Scientists and Engineers	8	CSCI 152 Performance and Data Structures	8
	HST 100 History of Kazakhstan or WCS 150 Rhetoric and Composition	6	HST 100 History of Kazakhstan or WCS 150 Rhetoric and Composition	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	30

	Fall	ECTS	Spring	ECTS
Year 2	CSCI 231 Computer Systems & Organization	6	CSCI 272 Formal Languages	6
	CSCI 235 Programming Languages	8	CSCI 270 Algorithms	6
	MATH 273 Linear Algebra with Applications	8	ROBT 206 Microcontrollers with Lab	8
	MATH 251 Discrete Mathematics	6	MATH 321 Probability	6
	200-level writing and communication course (WCS 210, WCS 230, WCS 240, or WCS 202)	6	Kazakh Language	6
	Total semester ECTS credits	**34**	**Total semester ECTS credits**	**32**

	Fall	ECTS	Spring	ECTS
Year 3	CSCI 390 Artificial Intelligence	6	CSCI 333 Computer Networks	6
	CSCI 341 Database Systems	6	CSCI 332 Operating Systems	6
	CSCI 361 Software Engineering	6	CSCI 307 Research Methods	6
	Natural Science Elective*	6	Natural Science Elective	6
	Kazakh Language	6	BUS 101 Core Course in Business	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 4	CSCI 408 Senior Project I	6	CSCI 409 Senior Project II	6
	Technical Elective	6	Technical Elective	6
	Technical Elective	6	Technical Elective	6
	Open Elective	6	Ethics (PHIL 210)	6
	Social Science Elective (SOC, PLS, ANT, or ECON)	6		
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**24**
			Total ECTS credits	240

Technical Electives for the BSCS degree can be satisfied by any non-required course at 200-level or above offered by the CS department, as well as the following courses offered by other departments:

- MATH 351 Introduction to Numerical Methods with Applications
- MATH 407 Introduction to Graph Theory
- MATH 417 Cryptography
- PHYS 270 Computational Physics
- ROBT 310 Image Processing
- ROBT 407 Statistical Methods and Machine Learning

***Natural Science Electives** are any courses offered by Physics, Chemistry, Biology and Geology at 100-level or above that are not designated for "non-science majors".

Minor in Computer Science

Students from other departments of SEDS or other schools within NU can earn a "minor" in Computer Science by completing a minimum of six (6) courses, constituting a minimum of 40 ECTS credits. The two specifically required courses are:

- CSCI 151 Programming for Scientists and Engineers (8 ECTS credits)
- CSCI 152 Performance and Data Structures (8 ECTS credits)

The additional 24 ECTS credits must be earned through additional courses offered by the CS department at 200-level or above, excluding internships (CSCI 299 and CSCI 399), and including no more than one Directed Study course (CSCI 398).

BSc IN ROBOTICS AND MECHATRONICS

	Fall	ECTS	Spring	ECTS
Year 1	MATH 161 Calculus I	8	MATH 162 Calculus II	8
	PHYS 161 Physics for Scientists and Engineers I with Laboratory	8	PHYS 162 Physics for Scientists and Engineers II with Laboratory	8
	CSCI 151 Programming for Scientists and Engineers	8	CSCI 152 Performance and Data Structures	8
	HST 100 History of Kazakhstan or WCS 150 Rhetoric and Composition	6	HST 100 History of Kazakhstan or WCS 150 Rhetoric and Composition	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 2	ROBT 201 Mechanics: Statics and Dynamics	6	ROBT 202 System Dynamics and Modeling	6
	ROBT 203 Electrical and Electronic Circuits I with Laboratory	8	ROBT 204 Electrical and Electronic Circuits II with Laboratory	8
	ROBT 205 Signals and Systems with Laboratory	8	ROBT 206 Microcontrollers with Laboratory	8
	MATH 273 Linear Algebra with Applications	8	MATH 274 Introduction to Differential Equations	6
			200-level writing and communication course (WCS 210, WCS 230, WCS 240, or WCS 202)	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**34**

	Fall	ECTS	Spring	ECTS
Year 3	ROBT 301 Mechanical Design I with CAD and Machining Laboratory	8	ROBT 312 Robotics I: Kinematics and Dynamics	6
	ROBT 303 Linear Control Theory with Laboratory	8	ROBT 304 Electromechanical Systems with Laboratory	8
	Major Elective 1	6	Major Elective 2	6
	Natural Science Elective	6	MATH 321 Probability	6
	Kazakh Language	6	Kazakh Language	6
	Total semester ECTS credits	**34**	**Total semester ECTS credits**	**32**

	Fall	ECTS	Spring	ECTS
Year 4	ROBT 403 Robotics II: Control and Learning	8	ROBT 402 Robotic/Mechatronic System Design	6
	Major Elective 3	6	ROBT 491 Graduation Project	6
	Ethics	6	Major Elective 4	6
	Natural Science Elective	6	BUS 101 Core Course in Business	6
	Social Science Elective (SOC, PLS, ANT, or ECON)	6		
	Total semester ECTS credits	**32**	**Total semester ECTS credits**	**24**
			Total ECTS credits	246

	Course Title
Robotics MAJOR Electives	ROBT 305 Embedded Systems
	ROBT 307 Power Electronics
	ROBT 308 Industrial Automation
	ROBT 310 Image Processing
	ROBT 407 Machine Learning and Applications
	ROBT 414 Human-Robot Interaction
	Students can take other technical courses with 200+ codes (mostly from CS) with the consent of their academic advisors.

SCHOOL OF MINING AND GEOSCIENCES

The School of Mining and Geosciences offers three four year full-time undergraduate degree programs, which are BSc in Mining Engineering, BSc in Petroleum Engineering, and BSc in Geology. For the specific requirements of each program see the degree programs below. The Undergraduate Core Curriculum Framework has been in corporated into these programs.

BS IN MINING ENGINEERING

	Fall	ECTS	Spring	ECTS
Year 1	MATH 161 Calculus I	8	SMG 100 Introduction to Natural Resources Extraction	6
	PHYS 161 Physics I for Scientists and Engineers with Laboratory	8	MATH 162 Calculus II	8
	Kazakh Language	6	GEOL 101 Fundamentals of Geology	6
	CHEM 101 General Chemistry I with Laboratory	8	PHYS 162 Physics II for Scientists and Engineers with Laboratory	8
	WCS 150 Rhetoric and Composition or HST 100 History of Kazakhstan	6	WCS 150 Rhetoric and Composition or HST 100 History of Kazakhstan	6
	Total semester ECTS credits	**36**	**Total semester ECTS credits**	**34**

	Fall	ECTS	Spring	ECTS
Year 2	ROBT 201 Mechanics: Statics and Dynamics	6	ENG 101 Programming for Engineers	6
	ENG 200 Engineering Mathematics III (Differential Equations and Linear Algebra)	6	MATH 310 Applied statistical methods	6
	PETE 201 Fluid Mechanics and Thermodynamics	6	WCS 210 Technical writing	6
	CEE 200 Structural Mechanics I	6	MINE 201 Mineral processing	6
	PHIL 210 Ethics	6	Kazakh Language	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

Year 3	Fall	ECTS	Spring	ECTS
	MINE 301 Mine Surveying and GIS	6	MINE 310 Rock Breakage	6
	MINE 302 Fundamentals of Geomechanics	6	MINE 306 Underground Mining Systems and Design	6
	MINE 304 Resource Estimation	6	MINE 307 Surface Mining Systems and Design	6
	GEOL 305 Geology of Ore Deposits	6	MINE 308 Mine Planning	6
	MINE 303 Mine Ventilation	6	MINE 309 Sustainability and Mining Environment	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

Year 4	Fall	ECTS	Spring	ECTS
	MINE 401 Mining Geotechnical Engineering and Ground Control	6	MINE 403 Mine Management and Risk	6
	SMG 200 Resource Economics and Project Valuation	6	BUS 101 Core Course in Business	6
	MINE 402 Coal Mining	6	MINE 406 Mine Design Project	6
	Technical Elective 1	6	Technical Elective 2	6
	Research Project 1	6	Research project 2	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**
			Total ECTS credits	250

	Technical Elective Courses	ECTS
	Automation and Robotics	6
	Geometallurgy	6
	Mechanized Excavation	6
	Geostatistics	6
	Digital Mine	6

BS IN PETROLEUM ENGINEERING

	Fall	ECTS	Spring	ECTS
Year 1	MATH 161 Calculus I	8	SMG 100 Introduction to Natural Resources Extraction	6
	PHYS 161 Physics I for Scientists and Engineers with Laboratory	8	MATH 162 Calculus II	8
	CHEM 101 General ChemistryI with Laboratory	8	GEOL 101 Fundamentals of Geology	6
	Kazakh Language	6	PHYS 162 Physics II for Scientists and Engineers with Laboratory	8
	WCS 150 Rhetoric and Composition or HST 100 History of Kazakhstan	6	WCS 150 Rhetoric and Composition or HST 100 History of Kazakhstan	6
	Total semester ECTS credits	**36**	**Total semester ECTS credits**	**34**

	Fall	ECTS	Spring	ECTS
Year 2	ROBT 201 Mechanics: Statics and Dynamics	6	ENG 101 Programming for Engineers	6
	ENG 200 Engineering Mathematics III (Differential Equations and Linear Algebra)	6	PETE 202 Transport Phenomena	6
	PETE 201 Fluid Mechanics and Thermodynamics	6	WCS 210 Technical writing	6
	CHEM 102 General Chemistry II	6	PETE 203 Drilling Engineering	8
	CEE 200 Structural Mechanics I	6	PETE 204 Reservoir Rock Fluid Properties	8
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**34**

	Fall	ECTS	Spring	ECTS
Year 3	PETE 302 Reservoir Engineering I	8	PETE 307 Production Engineering	6
	PETE 303 Well Logging and Formation Evaluation	6	PETE 306 Reservoir Engineering II	6
	PHIL 210 Ethics	6	PETE 308 Enhanced oil recovery	6
	PETE 304 Well Completion and Stimulation	6	Kazakh language	6
	PETE 301 Numerical Methods for Petroleum Engineers	6	PETE 305 Well Test Analysis	6
	Total semester ECTS credits	**32**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 4	PETE 400 Capstone Design Project I	6	PETE 407 Capstone Design Project II	6
	PETE 401 Reservoir Simulation	6	Technical Elective II	6
	Technical Elective I	6	BUS 101 Core Course in Business	6
	GEOL 401 Petroleum geology and geochemistry	6	PETE 403 Reservoir Geome-chanics	6
	Managerial economics	6		
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**24**
			Total ECTS credits	250

Technical electives: Advanced technologies in drilling, heavy oil resources and recovery, naturally fractured reservoirs, production enhancement, reservoir management, surface facilities, probability and geostatistics, and health, safety, environment and professional ethics.

Technical Electives				
Course	School	ECTS Credits	Workload (hours / semester)	
			Class Hours	Self-study
Advanced Technologies in Drilling	SMG	6	50	100
Heavy Oil Resources and Recovery	SMG	6	50	100
Naturally Fractures Reservoirs	SMG	6	50	100
Production Enhancement	SMG	6	50	100
Reservoir Management	SMG	6	50	100
Surface Facilities	SMG	6	50	100
Probability and Geostatistics	SMG	6	50	100

BS IN GEOLOGY

	Fall	ECTS	Spring	ECTS
Year 1	MATH 161 Calculus I	8	SMG 100 Introduction to Natural Resources Extraction	6
	PHYS 161 PhysicsI for Scientists and Engineers with Laboratory	8	MATH 162 Calculus II	8
	CHEM 101 General Chemistry I with Laboratory	8	GEOL 101 Fundamentals of Geology	6
	Kazakh Language	6	PHYS 162 Physics II for Scientists and Engineers with Laboratory	6
	WCS 150 Rhetoric and Composition or HST 100 History of Kazakhstan	6	WCS 150 Rhetoric and Composition or HST 100 History of Kazakhstan	6
	Total semester ECTS credits	**36**	**Total semester ECTS credits**	**34**

	Fall	ECTS	Spring	ECTS
Year 2	GEOL 201 Mineralogy	6	Programming for scientists and engineers (CSCI 151)	6
	GEOL 202 Geologic Maps and Cross-Sections	6	GEOL 205 Paleontology	6
	Kazakh Language	6	GEOL 204 Sedimentology and Stratigraphy	6
	200-level Writing or Communication course (WCS250)	6	GEOL 203 Sedimentary Petrology	6
	PHIL 210 Ethics	6	GEOL 206 Field Geology I	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 3	GEOL 301 Igneous and Metamorphic Petrology	6	GEOL 306 Geodynamics	6
	GEOL 302 Thermodynamics and Geochemistry	6	GEOL 307 Geographic Information Systems	6
	GEOL 303 Structural Geology	6	GEOL 308 Geostatistics	6
	GEOL 304 Geophysics	6	GEOL 309 Hydrogeology	6
	GEOL 305 Geology of ore deposits	6	GEOL 310 Field Geology II	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 4	GEOL 401 Petroleum geology and geochemistry	6	BUS 101 Core Course in Business	6
	GEOL 402 Environmental geo-chemistry	6	GEOL 405 Research Project II	6
	GEOL 403 Water Resource Management	6	Technical Elective I	6
	ECON 323 Managerial Economics	6	Technical Elective II	6
	GEOL 404 Research Project 1	6	Technical Elective III	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**
			Total ECTS credits	**250**

	Course Title	ECTS
Technical Electives	Exploration Geology & Geophysics	6
	Petroleum Systems and Basin Modelling	6
	Geochemical Modeling of Water-Rock Systems	6
	Acid Gas Injection & CO2 Sequestration	6

SCHOOL OF MEDICINE

The School of Medicine offers two full-time undergraduate programs, which are BSc in Medical Sciences and BS in Nursing. The Undergraduate Core Curriculum Framework has been incorporated into these programs. Degree program requirements are usually updated every year, and may include changes. For the specific requirements of each program see the degree programs below.

BS IN NURSING

	Fall	ECTS	Spring	ECTS
Year 1	CHEM 090 Chemistry + Lab	6	NUR 101/L Anatomy and Physiology 1	8
	WCS 150 Rhetoric and Composition or HST 100 History of Kazakhstan	6	NUR 102/L Anatomy and Physiology 2	8
	Kazakh Language I	6	WCS 150 Rhetoric and Composition or HST 100 History of Kazakhstan	6
	NUR 112 Introduction to Professional Nursing	4	Kazakh language II	6
	NUR 103 Microbiology for Nursing	8	SOC 101 Introduction to Sociology	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**34**

	Fall	ECTS	Spring	ECTS
Year 2	NUR 201 Pathophysiologic Foundations of Nursing Care	6	NUR 205 Psychology for the Health Practitioner	4
	NUR 202 Introduction to Genetics and Molecular The rapeutics	6	NUR 122 Medical Terminology	4
	NUR 203 Pharmacology and Therapeutics	6	NUR 212/L Foundations of Nursing Practice 2	4
	NUR 211/L Foundations of Nursing Practice 1	6	NUR 213/C Medical-Surgical Nursing 1 + Clinical	14
	NUR 121 Introduction to Basic Statistics for Evidence Based Practice	6	NUR 221 Nursing Research: Introduction to Critical Appraisal and Evidence-Based Pratice	6
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**32**

	Fall	ECTS	Spring	ECTS
Year 3	WCS 202 Introduction to Public Speaking	6	NUR 313/C Medical Surgical Nursing 2 + Clinical	14
	NUR 321 Ethics in Nursing and Health	4	NUR 314/C Psychiatric Nursing + Clinical	10
	NUR 322 Nursing Clinical Informatics	4	NUR 204 Nutrition for Clinical Practice	4
	NUR 311/C Obstetrics + Clinical	10	NUR 315 Health Promotion and Disease Prevention	4
	NUR 312/C Pediatrics + Clinical	10		
	Total semester ECTS credits	**34**	**Total semester ECTS credits**	**32**

	Fall	ECTS	Spring	ECTS
Year 4	NUR 411/C Community Health Nursing + Clinical	10	NUR 415/C Clinical Transitions Capstone	18
	BUS 101 Core Course in Business	6	NUR 421 Data Analytics for Quality Improvement	6
	NUR 413/C Medical–Surgical Nursing 3+ Clinical	14		
	NUR 412 Geriatric Nursing	4		
	Total semester ECTS credits	**34**	**Total semester ECTS credits**	**24**
			Total semester ECTS	250

BSc IN MEDICAL SCIENCES

	Fall	ECTS	Spring	ECTS
Year 1	NUSM 101 Introduction to Medicine	4	BIOL 120 Modern Biology II with Laboratory	8
	BIOL 110 Modern Biology I with Laboratory	8	CHEM 102 General Chemistry II	6
	CHEM 101 General Chemistry I	6	MATH Core Curriculum course	8
	WCS 150 Rhetoric and Composition	6	Kazakh Language II	6
	Kazakh Language I	6	CHEM 101 General Chemistry I Laboratory	2
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 2	CHEM 211 Organic Chemistry	6	BIOL 341 or CHEM 341 Biochemistry	6
	Social Science elective	6	Computer Science (Any CSCI course or SEDS programming course)	6
	Elective (Any Physics course)	8	200-level Writing or Communication course	6
	Elective (Any SSH course)	6	BUS 101 Core Course in Business	6
	Elective (Any BIOL course, including a core course)	6	HST 100 History of Kazakhstan	6
	Total semester ECTS credits	**32**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 3	NUSM 301 Introduction to Immunology, Microbiology and Genetics	6	NUSM 310 Capstone Project	30
	NUSM 302 Introduction to Statistics for Evidence-Based Practice	6		
	NUSM 303 Introduction to Anatomy and Histology	6		
	BIOL 355 Critical Research Reasoning	6		
	Ethics Core Curriculum Course	6		
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**30**

	Fall	ECTS	Spring	ECTS
Year 4	NUSM 401 Introduction to Being a Physician	4	NUSM 405 Fuel Metabolism	4
	NUSM 402 Medical Anatomy	11	NUSM 406 Immunology in Health and Disease	7
	NUSM 403 Human Genetics	6	NUSM 407 Medical Microbiology	11
	NUSM 404 Cellular Pathologic Basis of Disease	9	NUSM 408 Neuroscience	9
	Total semester ECTS credits	**30**	**Total semester ECTS credits**	**31**
			Total semester ECTS	243

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