



2019 - 2020

**UNDERGRADUATE
ACADEMIC
HANDBOOK**





WELCOME, CLASS OF 2023

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 2023 graduate with a wonderful memory of NU and take another exciting step in your future.

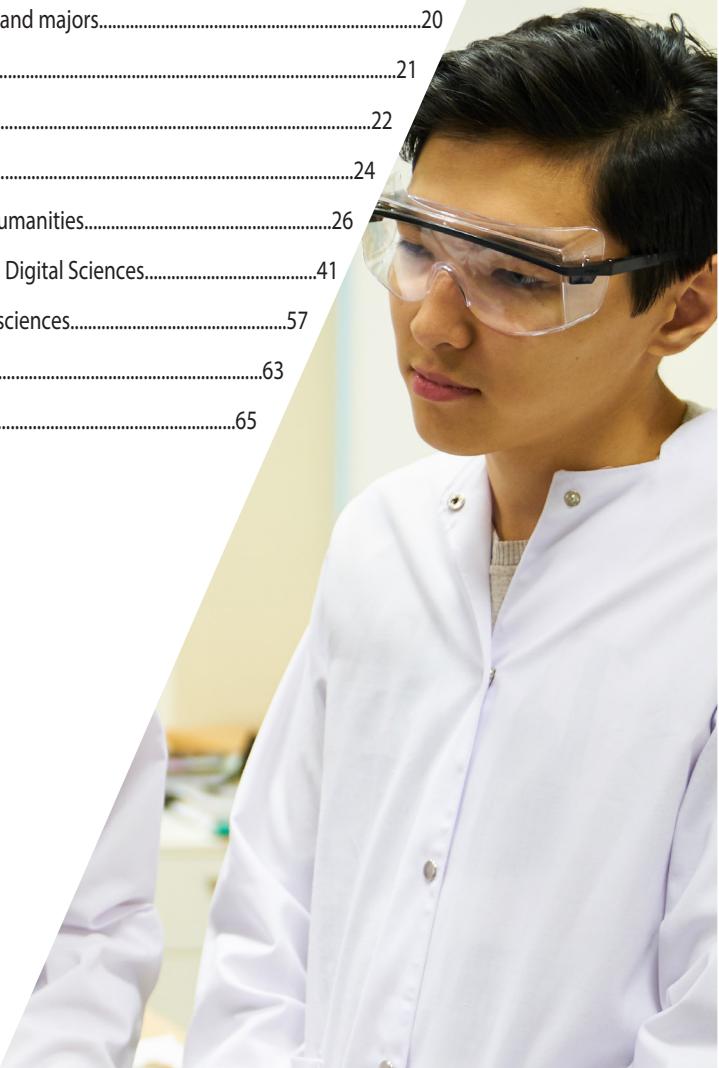
When you graduate in 2023, you will be joining over 3000 alumni who have gone on and made futures for themselves in graduate schools from Stanford University to MIT to Imperial College among many others, along with those who built their futures in leading global companies. We know that you will also 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

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GRADUATE ATTRIBUTES

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

FALL 2019

ACADEMIC EVENT	DATES	DAY OF THE WEEK
Orientation	5-9 August 2019	Monday – Friday
HOLIDAY – Kurban Eid	11 August 2019	Sunday
FIRST DAY of classes	12 August 2019	Monday
Last day to ADD	16 August 2019	Friday
Last day to DROP	23 August 2019	Friday
HOLIDAY - Constitution Day	30 August 2019	Friday
Fall Break	30 September – 4 October 2019	Monday-Friday
WITHDRAWAL Deadline	9 October 2019	Wednesday
Spring 2019 Registration for UG classes	November 2019	TBA
LAST DAY of classes	22 November 2019	Friday
Final Examinations	24-30 November 2019 (inclusive of weekends)	Sunday-Saturday
HOLIDAY – First President's Day	1 December 2019	Sunday
Final Examinations	2-4 December 2019 (inclusive of weekends)	Monday – Wednesday
Grades available to students	10 December 2019	Tuesday
HOLIDAY – Independence Day	16-17 December 2019	Monday-Tuesday
Fall Degree Conferral	January 2020	TBA

HOLIDAYS

Kurban Eid	11 August 2019	Constitution Day	30 August 2019
First President's Day	1 December 2019	Independence Day	16-17 December 2019

SPRING 2020

ACADEMIC EVENT	DATES	DAY OF THE WEEK
HOLIDAY – New Year	1-2 January 2020	Wednesday-Thursday
FIRST DAY of classes	13 January 2020	Monday
Last day to ADD	17 January 2020	Friday
Last day to DROP	24 January 2020	Friday
WITHDRAWAL Deadline	4 March 2020	Wednesday
HOLIDAY – International Women's Day	8 March 2020	Sunday
Spring Break	23-27 March 2020	Monday-Friday
Summer Registration	April 2020	TBA
LAST DAY of classes	24 April 2020	Friday
Final Examinations	26 –30 April 2020	Sunday – Tuesday
HOLIDAY - Kazakhstan's People Unity Day	1 May 2020	Wednesday
Final Examinations	2 - 6 May 2020	Saturday - Wednesday
HOLIDAY – Defender of the Fatherland Day	7 May 2020	Thursday
HOLIDAY – Victory Day	9 May 2020	Saturday
Grades available to students	13 May 2020	Friday
Spring Degree Conferral	June 2020	TBA
NU Graduation	June 2020	TBA

HOLIDAYS

New Year	1-2 January 2020	Christmas	7 January 2020
Women's Day	8 March 2020	Nauryz	21-23 March 2020
Kazakhstan's People Solidarity Holiday	1 May 2020	Defenders' day	7 May 2020
Victory Day	9 May 2020	Victory Day	9 May 2020

SUMMER 2020

ACADEMIC EVENT	DATES	DAY OF THE WEEK
FIRST DAY of summer classes	1 June 2020	Monday
Last day to ADD	3 June 2020	Wednesday
Last day to DROP	5 June 2020	Friday
WITHDRAWAL Deadline	3 July 2020	Friday
HOLIDAY – Day of the Capital	6 July 2020	Monday
LAST DAY of classes	22 July 2020	Wednesday
Final Exams	23-24 July 2020	Thursday – Friday
Grades available to students	28 July 2020	Tuesday
HOLIDAY: Kurban Eid	30 July 2020	Thursday
Summer Conferral of Degrees	July - August 2020	TBA
Registration for Fall	July – August 2020	TBA



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.

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.

LOCATION:

Block 9, Room 9151, 1st floor (Office of the Registrar)

Block 9, Room 9113 and #9119, 1st floor (Academic Advising Unit)

OFFICE HOURS:

Monday 8:30 am - 5:30 pm

Tuesday 8:30 am - 5:30 pm

Wednesday 8:30 am - 5:30 pm

Thursday 1:30 pm - 5:30 pm

Friday 8:30 am - 5:30 pm

Academic Advising Unit:

Monday - Friday 8:30 am – 6:30 pm

Thursday 2:00 pm – 6:30 pm

ORDERING ACADEMIC DOCUMENTS

Office provides Academic documents such as, enrolment verifications, official transcripts and other documents by online request of the student. Each request is processed within 3 working days. To request academic documents, please follow the instructions:

1. Login to MyRegistrar (registrar.nu.edu.kz)
2. Click on "Online ordering Academic documents"
3. Choose the document type you need:
 - Enrolment verification;
 - Enrolment verification for SVC students (Attachment 2-1);
 - Enrolment verification for SVC students (Attachment 4);
 - Enrolment verification for SVC students (Attachment 6);
 - 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

REMEMBER!

There is a three (3) working day processing period for all the requests



FAQ

1. What is Academic document?

Official transcript, enrolment verification, enrolment verifications for SVC, academic Spravka and more considered as Academic documents issued by the Office

2. Can my friend pick up my Academic documents?

Yes, if you email the full name of the person who will pick up your documents to registrar@nu.edu.kz.

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 will not be returned.

5. Could you state the amount of stipend in my Enrolment verification?

No, we cannot indicate that information in the Enrolment verification. 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.

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

You can get your HSD only for a certain period of time (10 days). Instead you will require to leave your State ID and/or Passport. We also can send a scanned copy of your HSD by your e-request to registrar@nu.edu.kz.

9. 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 schedule-registrar@nu.edu.kz.

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

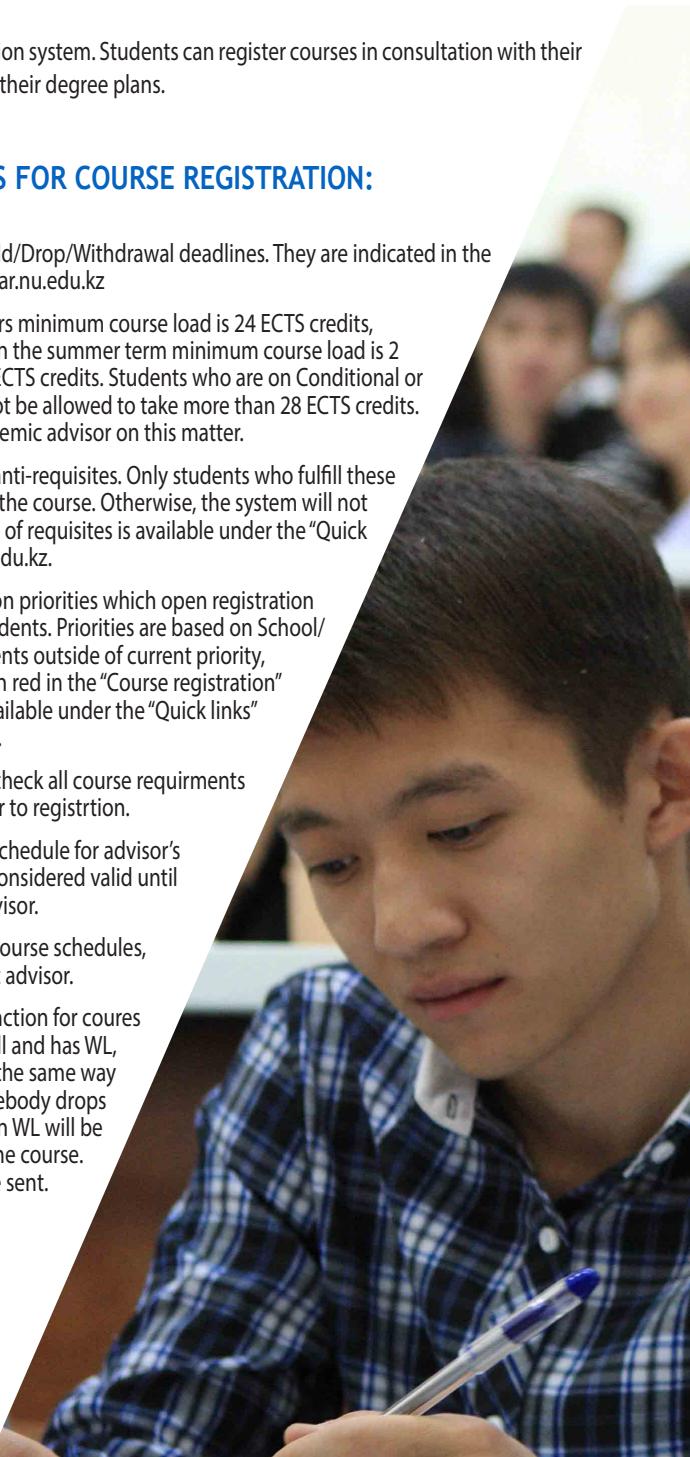
Yes, you have to inform our Office and send all the required documents to registrar@nu.edu.kz.

REGISTRATION FOR COURSES

NU has an online course registration system. Students can register courses in consultation with their academic advisors and based on 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 minimum course load is 24 ECTS credits, maximum – 36 ECTS credits. In the summer term minimum course load is 2 ECTS credits, maximum – 16 ECTS credits. Students who are on Conditional or Probationary status should not be allowed to take more than 28 ECTS credits. Please consult with your academic advisor on this matter.
- 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 specific groups of students. Priorities are based on School/year of study/major. For students outside of 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 schedule for advisor’s 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) function for courses that are full. If the course is full and has WL, a student can register for WL the same way as for a regular course. If somebody drops the course, the first student on WL will be automatically registered for the course. A corresponding email will be sent.



REGISTRATION FOR COURSES

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

EXTRA PLACE FORM is used in case a student is given permission for extra place in an overloaded class.

PRIORITY OVERRIDE FORM is used in case a student is given permission to register for the course not keeping the established priority.

REQUISITE OVERRIDE FORM is used in case a student is given permission to register for the course without satisfying the required requisite(s).

CHANGE OF KAZAKH LEVEL FORM is used for changing the level of Kazakh language.

COURSE OVERLOAD FORM is used if the number of enrolled credits is higher than the allowed maximum (36 ECTS credits). This is provided in exceptional cases only.

COURSE UNDERLOAD FORM is used if the number of enrolled credits is lower than the allowed minimum (24 ECTS credits). This is provided in exceptional cases only.

ALL FORMS HAVE TO BE SUBMITTED TO THE SCHOOL OFFICE!



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 MyRegistrar system.

Step 2

Enter your Username and Password

If you have any questions concerning your password or username, please contact IT Helpdesk: helpdesk@nu.edu.kz

Step 3

Click on "Course Registration":



COURSE REGISTRATION

The module "Course registration" is intended to provide students with Course registration.

Step 4

Peruse the head of the appeared interface:

A screenshot of the "COURSE REGISTRATION" interface. It shows a search bar with fields for School, Course, Instructor, and Subject. Below the search bar are filters for Class Meetings (Mon-Sun) and a "Show available seats only" checkbox. To the right, it displays registration status (Close), Kazakh language level, Advisor information, and Enrolled credits (ECTS: 0). A "Go to Selected Courses" button is at the bottom right.

HOME / MYREGISTRAR / COURSE REGISTRATION

Registration for Summer 2019

You are logged as test.test | LOGOUT

Course Filter

School:

Instructor:

Subject:

Course:

Title/Code:

(Type course subject and at least one digit to find the course by course title, e.g. MUL 2*)

Show available seats only

Show all courses

Reset Filters

Class Meetings: Mon Tue Wed Thu Fri Sat Sun

Registration status: **Close**

Kazakh language level:

Advising status: Yes Waiting

Advisor 1:

Advisor 2:

Enrolled credits (ECTS): **0**

Go to Selected Courses

• REGISTRATION STATUS

-shows if registration is open or not.

• KAZAKH LANGUAGE LEVEL

-your registration for Kazakh language courses should be based on this level.

• REGISTRATION HOLD

-shows if your registration is held by advisor.

• ADVISING STATUS

- your current advising status.

Not Registered

- you haven not registered for any course yet.

Changed

- approval request has not been submitted yet.

Pending

- your request is under advisor's consideration.

Approved

- your schedule is approved by advisor.

Rejected

- your schedule is denied by advisor. Make the needed adjustments and resend your schedule.

• ENROLLED CREDITS

- number of currently enrolled credits.

HOW TO REGISTER

Step 5

Find the required course using filters and click on it so that the course description will appear on the right side. To add this course, click on the "Add to Selected Courses" button:

Code	Course title	ECTS Credits	Note
KAZ 201	Academic Kazakh I	6	SELECTED COURSE
KAZ 211	Academic Speaking in Kazakh	6	OPEN
ECON 498	Advanced Special Topics in Economics	6	Instructor's Permission Required.
KAZ 150	Basic Kazakh	6	Instructor's Permission Required.
BIOL 399	Biology Internship - 2B	6	Instructor's Permission Required.
MATH 161	Calculus I	8	OPEN
MATH 162	Calculus II	8	OPEN
CHEM 388	Chemistry Internship	6	Instructor's Permission Required.
KAZ 375	Cultural Studies and Kazakh Culture	6	OPEN
MATH 497	Directed Study in Mathematics	6	Instructor's Permission Required.
BIOL 492	Directed study in Biology	6	Instructor's Permission Required.
KFL 101	Elementary Kazakh as a Foreign Language I	8	Instructor's Permission Required.
KFL 102	Elementary Kazakh as a Foreign Language II	8	Instructor's Permission Required.
CHEM 102	General Chemistry II	6	OPEN
CHEM 102L	General Chemistry II lab	2	OPEN
ECON 398	General Special Topics in Economics	6	Instructor's Permission Required.
HST 100	History of Kazakhstan	6	OPEN
PLS 395	Independent Study	6	Instructor's Permission Required.

KAZ 375 Cultural Studies and Kazakh Culture Add to Selected Courses

Course Components:
Seminar 1 Mon Wed Fri 13:00- 8.327 Zeinep Zhumatayeva 21/24

Priority Registration:

Priority	School	Year of study	Major	Active
1	SEng	4 year UG SENG	n/a	Yes
1	SHSS	4 year UG SHSS	n/a	Yes
1	SST	4 year UG SST	n/a	Yes
2	SHSS	3 year UG SHSS	n/a	Yes
2	SST	3 year UG SST	n/a	Yes
2	SEng	3 year UG SENG	n/a	Yes
3	SEng	n/a	n/a	Yes
3	SMG	n/a	n/a	Yes
3	SST	n/a	n/a	Yes
3	SHSS	n/a	n/a	Yes

Course Requirements:
Prerequisites: Kazakh Language Advanced level OR KAZ 202A Kazakh Literature 2/KC (C- and above) OR KAZ 211 Academic Speaking in Kazakh (C- and above) OR KAZ 212 Academic Writing in Kazakh (C- and above)
Corequisites: -
Antirequisites: -

Course Information:
Breadth: n/a
Description:

Step 6

To register for selected courses, click on

Go to Selected Courses

Step 7

To start the registration:

1. Choose the course from the "Selected course" list
2. Select the appropriate section
3. Click on the "Pre-Register" button

Registered courses will appear in green color in timetable.

Waiting list (WL). If the section is full but has WL, the system will ask if you want to be placed on WL. Once placed, the system will indicate WL capacity and in which half you are placed in. You will not know your WL order number neither from the system nor from the instructor.

Step 8

To drop the course, click on "X" in the upper right corner:



Step 9

When the schedule is fully completed, it should be sent for academic advisor's approval by clicking the "Send to Advisor" button.

Search/Add classes

Selected courses

Calculus III
MATH 263 | {4 credit hours}

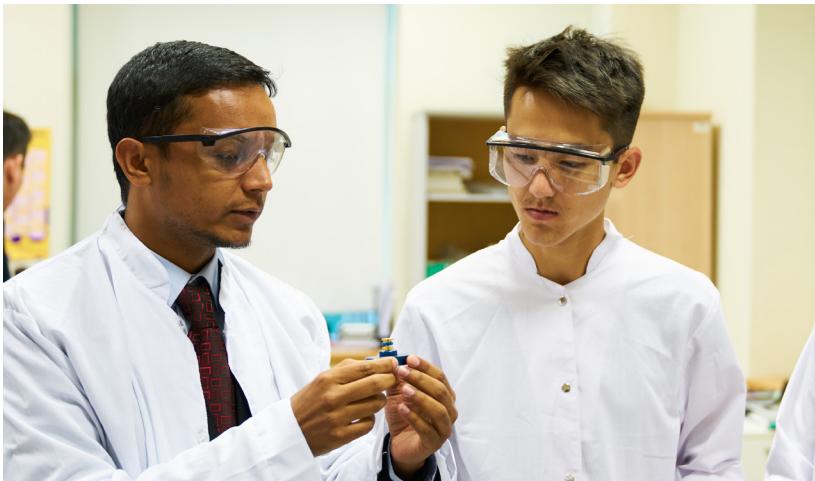
Discrete Mathematics
MATH 251 | {3 credit hours}

Send to Adviser

Monday	Tuesday
8:00- 8:50	
	Complex Analysis Lecture 1 / (09:00-09:50) Mark Lawrence Room: TBA
10:00- 10:50	
11:00- 11:50	
	Applied Statistical Methods Lecture 1 / (12:00-12:50) Natanael Karjanto Room: TBA
13:00- 13:50	
	Introduction to Number

IMPORTANT!

Once the schedule is sent, registration will be automatically blocked. No changes will be available. To remove the block, contact your advisor and ask him/her to remove the hold from your registration.



FAQ

1. Where can I find general schedule with list of sections, instructors and time slots?

registrar.nu.edu.kz -> Course schedule by Schools

2. Where can I find course requirements and registration priorities?

registrar.nu.edu.kz -> [Semester] Course list with requirements

3. What courses should I take?

Contact your advisor and peruse degree plans provided by each School.

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 declaration is 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?

Kazakh language registration is based on the Kazakh language level assigned by the Kazakh language department. For any questions, please contact Kazakh language department.

6. When should I click the "Send to advisor" button?

Click on the "Send to advisor" button only if your schedule is complete. Please note that your schedule has to be approved till the end of Add period.

7. I've made my schedule and sent an approval request to advisor. What is next?

Please wait – at the moment of approval you will receive automatic notification by email. If you don't receive any email, please contact your advisor.

8. What should I do if my request was denied?

Carefully read the reason of denial stated in the email and re-register for appropriate courses.

9. What if I want to change my schedule after advisor's approval?

Contact your advisor to remove the 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 Withdrawal period when dropping the course is called Withdrawal. It differs from the simple drop as grade "W" will appear in your transcript, however it will not influence GPA. Note: number of remaining enrolled credits after withdrawal should be not less than 24 ECTS.

GRADES AND GPA

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

Letter	%	Quality	Explanation points
A	95-100	4	Excellent; exceeds the highest standards in the assignment or 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

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

- Error in calculation
- Error in application of the class grade policy as presented in the Syllabus
- Incorrect entry of the grade into the database
- Incomplete marking of an assessment.
- For specific deadlines in grade appeal process, please check Academic Policies and Procedures on registrar.nu.edu.kz.

Mid-semester reports. Mid-semester reports are required from all course instructors in all courses to identify and assist students who may need additional academic guidance. Mid-semester grading will be based on the following system:

1. (S) Satisfactory – A student who is at a minimum C or above with excellent attendance.
2. (NS) Non-Satisfactory – Any student who is at a C- or below with attendance problems, and other problems/issues that may keep the student from successfully completing the courses.
3. Mid-semester reports and other provisional grades are not permanent and are only kept until final grades are recorded. Because mid-semester reports are not permanent, changes will not be accepted.



ACADEMIC STANDING

Good Academic Standing

A student meeting satisfactory academic progression as defined herein, and having a GPA and CGPA of 2.0 and above (out of 4.0) is considered to be in good academic standing.

Academic Warning

Students receive an Academic Warning notice when they are at risk of being placed on Academic Probation or to be dismissed at the end of the semester based on academic performance or based on failure to maintain satisfactory academic progress as evaluated before the end of the semester. A student will also receive notice of Academic Warning if his/her academic performance is deemed to be unsatisfactory for any other reason. Notification of Academic Warning will be sent by OR to the student, the School's Director of Studies and the student's advisor.

Academic Probation

A student who fails to maintain Good Academic Standing based on GPA will be placed on Academic Probation. At the end of one semester of Academic Probation, students are subject to dismissal from NU if they have not achieved the necessary conditions as stated above to return to Good Academic Standing.

Satisfactory Progress towards Degree

NU expects students to complete their degree requirements within four years (subject to the Policy on Fifth Year Study and other internal regulations of NU). To complete a degree in four years, students should obtain an average 30 ECTS per semester (including transfer credits and Summer courses). Any student who falls 30 or more ECTS credits behind this rate of completion will be subject to dismissal from NU.



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.



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. All students must follow the Student Code of Conduct. For full version, please contact Department of Student Affairs (DSA).

The information on **Leave of Absence** and **Withdrawal** is available on registrar.nu.edu.kz 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

The aims of the Core Curriculum are to:

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

Upon successful completion of the Core Curriculum, students will be able to:

1. Communicate fluently in the English Language;
2. Demonstrate competence in the Kazakh Language;
3. Describe and interpret major events in Kazakh and Kazakhstani history;
4. Demonstrate knowledge of the natural and social sciences;
5. Apply numerical and digital literacy skills;
6. Apply skills in business, design and entrepreneurial thinking;
7. Use research skills and methods to complete projects;
8. 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 SHSS 150 - Rhetoric and Composition, COMM 102 - 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

CORE CURRICULUM

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 and 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 SENG and SMG requirements)	1
		Any CSCI course OR SENG 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.	Course to be developed by GSB on Business Fundamentals and Entrepreneurship	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 intellectually agile, curious, creative and open-minded.	SHSS (PLS 210, SOC 201, WLL 273) SENG (BENG 343, BENG 384, ECHE 384, ECHE 385, ...) SST (BIOL 355, BIOL 356, 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.

SCHOOL OF SCIENCES AND HUMANITIES

The School of Sciences and Humanities offers 10 full-time undergraduate programs, which are BA in Anthropology, BA in Economics, BA in History, BA in Sociology, BA in Political Science and International Relations and BA in World Languages, Literature and Cultures, BSc in Biological Sciences, BSc in Chemistry, BSc in Mathematics and BSc in Physics. 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.

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 re-take courses in summer
2. to become undeclared/change their major

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

- ECON 101 Introduction to Microeconomics
- ECON 102 Introduction to Macroeconomics
- MATH 161 Calculus I

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:

- PLS120 Introduction to Political Theory
- PLS140 Introduction to Comparative Politics
- PLS150 Introduction to International Relations

DEGREE REQUIREMENTS

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

If student plans to major in **World Languages, Literatures and Cultures/History** no special requirements are required.

If student plans to major in **Biological Sciences**, he/she must complete 5 following courses with a grade of "C" or above in each course:

- BIOL 120 Modern Biology II with Laboratory
- CHEM 102 General Chemistry II
- CHEM 102L General Chemistry II Laboratory
- MATH 161 Calculus I
- CSCI 115 Programming Fundamentals

If student plans to major in **Chemistry**, he/she must complete 2 following courses with a grade of "C" or above in each course:

- CHEM 102 General Chemistry II
- CHEM 102L General Chemistry II Laboratory

If student plans to major in **Math**, he/she must complete following course with a grade of "C" or above in each course:

- MATH 162

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

- PHYS 162
- MATH 162
- CSCI 151

SCHOOL OF SCIENCES AND HUMANITIES

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 ANT 214/SOC 214 Qualitative Methods in Anthropology and Sociology
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	SHSS 150; Either COMM 102 (updated as COMM 202) OR a 200-level writing course
Other Humanities	24	Four Non-major Humanities electives
Other Social Sciences	18	Three Non-major Social Science electives
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
Electives	66	Any courses from SSH, SEDS, SMG
Total Degree Credits	240	

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
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

SCHOOL OF SCIENCES AND HUMANITIES

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	SHSS 150; Either COMM 102 (updated as COMM 202) OR a 200-level writing course
Other Humanities	24	Four Non-major Humanities electives
Other Social Sciences	18	Three Non-major Social Science electives
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
Electives	58	Any courses from SSH, SEDS, SMG
Total Degree Credits	240	

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 C (a minimum of B- for students who declare minor after 1 May 2020).

** The combination of MATH 321 Probability and MATH 322 Mathematical Statistics/MATH 310 Applied Statistical Methods is counted as prerequisite for Econometrics I.

SCHOOL OF SCIENCES AND HUMANITIES

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 273/ WLL 273
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	SHSS150; Either COMM 102 (updated as COMM 202) a 200-level writing course
Other Humanities	24	Four Non-major Humanities electives
Other Social Sciences	18	Three Non-major Social Science electives
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
Electives	72	Any courses from SSH, SEDS, SMG
Total Degree Credits	240	

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

SCHOOL OF SCIENCES AND HUMANITIES

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	SHSS150; Either COMM 102 (updated as COMM 202) a 200-level writing course
Other Humanities	24	Four Non-major Humanities electives
Other Social Sciences	18	Three Non-major Social Science electives
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
Electives	66	Any courses from SSH, SEDS, SMG
Total Degree Credits	240	

COURSE REQUIREMENTS FOR A PSIR MINOR

Elementary Courses	Two introductory courses from the following: PLS120 Introduction to Political Theory, PLS140 Introduction to Comparative Politics, PLS150 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	PLS210 Political Science Research methods or PLS211 Quantitative Methods in Political Science, 6 ECTS
Total credits	36

SCHOOL OF SCIENCES AND HUMANITIES

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	SHSS 150; Either COMM 102 (updated as COMM 202) OR a 200-level writing course
Other Humanities	24	Four Non-major Humanities electives
Other Social Sciences	18	Three Non-major Social Science electives
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
Electives	66	Any courses from SSH, SEDS, SMG
Total Degree Credits	240	

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

SCHOOL OF SCIENCES AND HUMANITIES

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
Writing & Communication Math	12	SHSS 150; Either COMM 102 (updated as COMM 202) a 200-level writing course
Other Humanities	24	Four Non-major Humanities electives
Other Social Sciences	18	Three Non-major Social Science electives
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
Electives	66	Any courses from SSH, SEDS, SMG
Total Degree Credits	240	

COURSE REQUIREMENTS IN WORLD LANGUAGES, LITERATURE AND CULTURES

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

SCHOOL OF SCIENCES AND HUMANITIES

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 SPA314 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

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

SCHOOL OF SCIENCES AND HUMANITIES

BSc IN BIOLOGICAL SCIENCES

	Fall	ECTS	Spring	ECTS
Year 1	BIOL 110 Modern Biology I with Laboratory	8	BIOL 120 Modern Biology II with Laboratory	8
	CHEM 101 General Chemistry I	6	CHEM 102 General Chemistry II	6
	CHEM 101L General Chemistry I Laboratory	2	CHEM 102L General Chemistry II Laboratory	2
	CSCI 151 Programming for Scientists and Engineers (CSCI 115 can be taken instead)	8	MATH 161 Calculus I	8
	HST 100 History of Kazakhstan	6	SHSS 150 Rhetoric and Composition	6
	Total semester ECTS credits	30	Total semester ECTS credits	30

	Fall	ECTS	Spring	ECTS
Year 2	CHEM 291 Organic Chemistry I	6	PYHS 161 Physics I for Scientists and Engineers with Lab	8
	CHEM 211L Organic Chemistry I Laboratory	2	MATH 310 Applied Statistical Methods	6
	BIOL 230 Human Anatomy and Physiology I with Laboratory	8	BIOL 231 Human Anatomy and Physiology II with Laboratory	8
	Kazakh Language	6	Social Science Elective (SOC, PLS, ANT, or ECON)	6
	COMM 102 (updated as COMM 202) or any 200 - level Writing course	6		
	Total semester ECTS credits	28	Total semester ECTS credits	28

SCHOOL OF SCIENCES AND HUMANITIES

	Fall	ECTS	Spring	ECTS
Year 3	BIOL 301 Molecular Biology of the Cell with Laboratory	8	BIOL 305 Introduction to Microbiology with Laboratory	8
	BIOL 341 Biochemistry	6	BIOL 355 Critical Research Reasoning	6
	Technical Elective	6	BIOL 370 Genetics	6
	Technical Elective	6	Open Elective	6
	Kazakh Language	6	Business Fundamentals and Entrepreneurship	6
	Total semester ECTS credits	32	Total semester ECTS credits	32

	Fall	ECTS	Spring	ECTS
Year 4	BIOL 410 Introduction to Immunology	6	BIOL 420 Bioethics	6
	BIOL 456 Biology Research Design	6	Technical Elective 4	6
	Technical Elective 3	6	Technical Elective	6
	Humanities or Social Sciences elective	6	Humanities or Social Sciences elective	6
	Open Elective	6	Open Elective	6
	Total semester ECTS credits	30	Total semester ECTS credits	30
				Total ECTS credits
				240

MINOR IN BIOLOGICAL SCIENCES

BIOL 101	Modern Biology I with Laboratory, 8 ECTS
BIOL 102	Modern Biology II with Laboratory, 8 ECTS
BIOL 230	Human Anatomy and Physiology I with Laboratory 8 ECTS
BIOL 231	Human Anatomy and Physiology II with Laboratory 8 ECTS
BIOL 301	Molecular Biology of the Cell with Laboratory 8 ECTS

One of the following 300/400 level courses:

BIOL 305	Introduction to Microbiology with Laboratory, 8, BIOL 101, BIOL 102
BIOL 370	Genetics,6, BIOL 101 BIOL 102 BIOL 301
BIOL 320	Developmental Biology, 6, BIOL 101, BIOL 102, BIOL 231
BIOL 341	Biochemistry,6, CHEM 292
BIOL 340	Introduction to Bioinformatics with Laboratory, 8, MATH 310
BIOL 352	Biology of Cancer, 6, BIOL 101, BIOL 102, BIOL 301, BIOL 231
BIOL 380	The Biology of Behaviour, 6, BIOL 101, BIOL 102, BIOL 301
BIOL 385	The Cell Signaling: principles and mechanisms, 6, BIOL 101, BIOL 102
BIOL 410	Introduction to Immunology, 6, BIOL 305 OR BIOL 301 OR BIOL 231
BIOL 430	Histology, 6, BIOL 230, BIOL 231
BIOL 440	Neuroscience, 6, BIOL 230
BIOL 445	Medical Microbiology, 6, BIOL 305, BIOL 230, BIOL 231
BIOL 450	Food Microbiology with laboratory, 8, BIOL 101, BIOL 102, BIOL 305
BIOL 455	Biotechnology, 6, BIOL 341, BIOL 370
BIOL 470	Advanced Cell Biology, 6, BIOL 301

Total credits	46 ECTS minimum
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SCHOOL OF SCIENCES AND HUMANITIES

BSc IN CHEMISTRY

	Fall	ECTS	Spring	ECTS
Year 1	CHEM 101 General Chemistry I	6	CHEM 102 General Chemistry II	6
	CHEM 101L General Chemistry I Laboratory	2	CHEM 102L General Chemistry II Laboratory	2
	BIOL 110 Modern Biology I with Laboratory	8	BIOL 120 Modern Biology II with Laboratory	8
	CSCI 151 Programming for Scientists and Engineers (CSCI 115 can be taken instead)	8	MATH 161 Calculus I	8
	HST 100 History of Kazakhstan	6	SHSS 150 Rhetoric and Composition	6
	Total semester ECTS credits	30	Total semester ECTS credits	30

	Fall	ECTS	Spring	ECTS
Year 2	CHEM 211 Organic Chemistry I	6	CHEM 212 Organic Chemistry II	6
	CHEM 211L Organic Chemistry I Laboratory	2	CHEM 212L Organic Chemistry II Laboratory	2
	CHEM 220 Quantitative Analysis with Lab	8	MATH 273 Linear Algebra with Applications	8
	MATH 162 Calculus II	8	PHYS 162 Physics II for Scientists and Engineers with Laboratory	8
	PHYS 161 Physics I for Scientists and Engineers with Lab	8	COMM 102 (updated as COMM 202) or any 200 - level Writing course	6
	Total semester ECTS credits	32	Total semester ECTS credits	30

SCHOOL OF SCIENCES AND HUMANITIES

	Fall	ECTS	Spring	ECTS
Year 3	CHEM 331 Physical Chemistry I	6	CHEM 332 Physical Chemistry II	6
	CHEM 331L Physical Chemistry I Lab	2	CHEM 332L Physical Chemistry II Lab	2
	CHEM 341 Biochemistry I	6	CHEM 320 Instrumental Analysis	6
	CHEM 341L Biochemistry I Lab	2	CHEM 320L Instrumental Analysis Laboratory	2
	Math 274 Introduction to Differential Equations	6	CHEM 350 Descriptive Inorganic Chemistry	6
	Kazakh Language I	6	CHEM 380 Research Methods	6
	Social Science Elective (SOC, PLS, ANT or ECON)	6	Kazakh Language	6
	Total semester ECTS credits	34	Total semester ECTS credits	34

	Fall	ECTS	Spring	ECTS
Year 4	CHEM 400 Chemistry Seminar	6	CHEM 4XX Major Elective	6
	CHEM 410 Structural Spectroscopy	8	CHEM 4XX Major Elective	6
	CHEM 450 Advanced Inorganic Chemistry	6	CHEM 4XX Major Elective	6
	CHEM 450 Advanced Inorganic Chemistry Lab	2	Business Fundamentals and Entrepreneurship	6
	CHEM 4XX Major Elective I	6	Directed Research II (Optional)	(6)
	Directed Research I (Optional)	(6)		
	Total semester ECTS credits	28 (34)	Total semester ECTS credits	24 (30)
			Total ECTS credits	246 (258)

MINOR IN CHEMISTRY

For a minor in chemistry, students should take the following chemistry courses. Courses will be distributed amongst the various branches of chemistry that reflect the breadth of the discipline, namely,

- General Chemistry I and II with associated labs (16 ECTS)
- Organic Chemistry I and II with associated labs (20 ECTS)
- Quantitative Chemical Analysis with lab (8 ECTS)
- Descriptive Inorganic Chemistry (6 ECTS)
- Biochemistry I with associated lab (8 ECTS) OR Physical Chemistry with associated labs (8 ECTS)

SCHOOL OF SCIENCES AND HUMANITIES

BSc IN MATHEMATICS

	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	6	SHSS150 Rhetoric and Composition	6
	Total semester ECTS credits	30	Total semester ECTS credits	30

	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	PHYS 270 Computational Physics	6
	Natural Science Elective	6	Natural Science Elective	6
	COMM 102 (updated as COMM 202) or any 200 - level Writing course	6	Kazakh Language	6
	Total semester ECTS credits	34	Total semester ECTS credits	30

SCHOOL OF SCIENCES AND HUMANITIES

	Fall	ECTS	Spring	ECTS
Year 3	MATH 361 Real Analysis I	6	MATH 351 Numerical Methods	6
	MATH 322 Mathematical Statistics	6	MATH 402 Abstract Algebra I	6
	Major Elective	6	Major Elective	6
	Technical Elective	6	Research Methods	6
	Kazakh Language	6	Business Fundamentals and Entrepreneurship	6
	Total semester ECTS credits	30	Total semester ECTS credits	30

	Fall	ECTS	Spring	ECTS
Year 4	Major Elective	6	Major Elective	6
	Major Elective	6	Technical Elective	6
	Technical Elective	6	Open Elective	6
	Ethics	6	Social Science Elective (SOC, PLS, ANT, or ECON)	6
	Open Elective	6	Open Elective	6
	Total semester ECTS credits	30	Total semester ECTS credits	30
				Total ECTS credits
				244

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

SCHOOL OF SCIENCES AND HUMANITIES

BSc IN PHYSICS

	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	CSCI 152 Performance and Data Structures	8
	HST 100 History of Kazakhstan	6	SHSS 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 273 Linear Algebra with Applications	8	MATH 274 Introduction to Differential Equations	6
			COMM 102 (updated as COMM 202) or any 200 - level Writing course	6
	Total semester ECTS credits	30	Total semester ECTS credits	32

SCHOOL OF SCIENCES AND HUMANITIES

	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
	Technical Elective	6	PHYS 370 Optics with Laboratory	8
	Kazakh Language	6	PHYS 395 Research Methods in Physics	6
	Social Science Elective (SOC, PLS, ANT, or ECON)	6	Technical Elective	6
	Total semester ECTS credits	30	Total semester ECTS credits	32

	Fall	ECTS	Spring	ECTS
Year 4	PHYS 452 Quantum Mechanics II	6	PHYS 499 Graduation Project	6
	PHYS 465 Advanced Experimental Physics	6	Major Elective	6
	Major Elective	6	Business fundamentals and Entrepreneurship	6
	Ethics	6	Technical Elective	6
	Kazakh Language	6	Technical Elective	6
	Total semester ECTS credits	30	Total semester ECTS credits	30
				Total ECTS credits
				242

Minor in Physics

In addition to Physics I (PHYS161) and Physics II (PHYS162), the following Physics courses are required for Physics Minor Degree:

- Modern Physics (PHYS261)
- Computational Physics with Laboratory (PHYS270)
- Classical Mechanics I (PHYS221)
- Thermodynamics and Statistical Physics (PHYS280)
- Mathematical Methods of Physics (PHYS315 or PHYS411)
- (optional) Quantum Mechanics I (PHYS451)

Suggested order: PHYS261, PHYS270, PHYS221, PHYS280, PHYS315, (PHYS451)

Other PHYS courses 300-level and above can be used as approved by advisor (excluding PHYS399). The suggested choice is Classical Electrodynamics PHYS361 and Optics with Laboratory (PHYS370)

Some courses may be substituted with a course or a combination of courses from other departments covering related topics. A list of currently allowed substitutions is below. If more than 1 substitution is applied, then optional 6th course must be taken.

1. Modern Physics (PHYS261) = Physical Chemistry II (CHEM332)
2. Computational Physics with Laboratory (PHYS270) = Computational Chemistry (CHEM431) = Numerical Methods with Applications (MATH351)
3. Thermodynamics and Statistical Physics (PHYS280) = Physical Chemistry I (CHEM331)
4. Mathematical Methods of Physics (PHYS315 or PHYS411) = Complex Analysis (MATH480) + Partial Differential Equations (MATH481) + Fourier analysis (MATH 482).

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 Framework 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
	SHSS 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	SHSS 210 Technical Writing	6
	Ethics (PHIL 210, 211, OR 212)	6	ENG 201 Applied 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

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

Year 3	Fall	ECTS	Spring	ECTS
	ECON 323 Managerial Economics	6	Fundamentals of Entrepreneurship and Management	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

Year 4	Fall	ECTS	Spring	ECTS
	ENG 400 Capstone Project	6	ENG 400 Capstone Project	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

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

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 & Wastewater 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:

- ENG 300 Interdisciplinary Design Project
- CEE 463 Individual Research Project in Civil Engineering I
- CEE 464 Individual Research Project in Civil Engineering II

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

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	
SHSS 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	ENG200 Differential Equations and Linear Algebra	6	ENG 201 Applied Statistics	6
ELCE 203 Signals and Systems	6	ENG 202 Numerical Methods in Engineering	6	
ELCE 200 Introduction to Electrical Circuits	6	ELCE 204 Solid State Devices	6	
ELCE 202 Digital Logic Design	6	ELCE 201 Circuit Theory	6	
Ethics (PHIL 210, 211, OR 212)	6	SHSS 210 Technical Writing	6	
Total semester ECTS credits	30	Total semester ECTS credits	30	

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

	Fall	ECTS	Spring	ECTS
Year 3	ELCE 301 Electronic Circuits	6	ELCE 303 Power System Analysis	6
	ELCE 304 Computer Architecture	6	ELCE 300 Microprocessor Systems	6
	ELCE 307 Digital Signal Processing	6	ELCE 305 Data Structures and Algorithms for ECE	6
	ELCE 302 Electrical Machines	6	ELCE 306 Discrete Math Structures for ELCE	6
	ELCE 308 Communication Systems	6	Selection among Interdisciplinary Design Project (IDP) OR Independent Study	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
	ECON 323 Managerial Economics	6	Fundamentals of Entrepreneurship and Management	6
	Kazakh Language	6	Discipline Elective 3	6
	Discipline Elective 1	6	Discipline Elective 4	6
	Discipline Elective 2	6	Discipline Elective 5	6
	Total semester ECTS credits	30	Total semester ECTS credits	30
			Total ECTS credits	248

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

Devices and Circuits	Power Systems	Signal Processing and Communications Systems	Computer Engineering
Mixed Signal Circuits	Power Amplifier and Wireless Transmitter 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

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

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	SHSS 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 Statistics	6
	CHME 201 Chemical Engineering Thermodynamics	6	CHME 202 Fluid Mechanics	6
	SHSS 210 Technical Writing	6	CHME 203 Organic and Polymer Chemistry	6
	Total semester ECTS credits	30	Total semester ECTS credits	30

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

	Fall	ECTS	Spring	ECTS
Year 3	Fundamentals of Entrepreneurship and Management	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

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

CHEMICAL AND MATERIALS ENGINEERING ELECTIVE COURSES

Students should choose 4 elective courses (24 ECTS) 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 Wastewater 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 Oil and Gas Industry (D)
- CHME 459 Biomechanics (D)
- CHME 421 Tissue Engineering (B)
- CHME 460 Polymer Processing and Rheology (D)
- CHME 461 Powder Technology (D)

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

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	SHSS 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
	ENG 200 Differential Equations and Linear Algebra	6	MAE 205 Materials and Manufacturing I	6
	MAE 201 Computer Aided Design	6	ENG 201 Applied Statistics	6
	CEE 201 Environmental Chemistry	6	ENG 202 Numerical Methods in Engineering	6
	SHSS 210 Technical Writing	6	Ethics (PHIL 210, 211, OR 212)	6
	Total semester ECTS credits	30	Total semester ECTS credits	30

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

	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	ENG400 Capstone Project	6	ENG400 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

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

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

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

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	6	SHSS 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
	COMM 102 (updated as COMM 202) or any 200 - level Writing course	6	Kazakh Language	6
	Total semester ECTS credits	34	Total semester ECTS credits	32

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

Students from other departments of SST 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).

	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	Business Fundamentals and Entrepreneurship*	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*	6
	Social Science Elective (SOC, PLS, ANT, or ECON)	6		
	Total semester ECTS credits	30	Total semester ECTS credits	24
			Total ECTS credits	240

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

BSc IN ROBOTICS AND MECHATRONICS

Fall	ECTS	Spring	ECTS
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	6	SHSS 150 Rhetoric and Composition	6
Total semester ECTS credits	30	Total semester ECTS credits	30

Fall	ECTS	Spring	ECTS
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
		COMM 102 (updated as COMM 202) or any 200 - level Writing course	6
Total semester ECTS credits	30	Total semester ECTS credits	34

Year 1

Year 2

SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

	Fall	ECTS	Spring	ECTS
Year 3	ROBT 301 Mechanical Design I with CAD 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	Business Fundamentals and Entrepreneurship	6
	Social Science Elective (SOC, PLS, ANT, or ECON)	6		
	Total semester ECTS credits	32	Total semester ECTS credits	24
			Total ECTS credits	246

Robotics Electives	Course Title
	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

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 incorporated 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
	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	8
	SHSS 150 Rhetoric and Composition	6	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	MINE 101 Mineral Processing	6
	PETE 201 Fluid Mechanics and Thermodynamics	6	Structural Mechanics	6
	Writing or Communication course	6	ENG 201 Applied Statistics	6
	PHIL 210 Ethics	6	Kazakh Language	6
	Total semester ECTS credits	30	Total semester ECTS credits	30

SCHOOL OF MINING AND GEOSCIENCES

	Fall	ECTS	Spring	ECTS
Year 3	MINE 301 Mine Surveying and GIS	6	MINE 401 Rock Fragmentation	6
	MINE 302 Geomechanics	6	MINE 402 Hard Rock Underground Mining Systems and Design	6
	MINE 407 Resource Estimation	6	MINE 403 Hard Rock Surface Mining Systems and Design	6
	GEOL 401 Geology of Ore Deposits	6	MINE 404 Mine Planning	6
	MINE 305 Mine Ventilation	6	MINE 405 Sustainability and Mining Environment	6
	Total semester ECTS credits	30	Total semester ECTS credits	30

	Fall	ECTS	Spring	ECTS
Year 4	MINE 406 Mining Geotechnical Engineering and Ground Control	6	Mine Management and Risk	6
	ECON 323 Managerial Economics	6	Fundamentals of Entrepreneurship and Management*	6
	MINE 408 Coal Mining Mine Design	6	Hard Rock Mine Design	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

	Course Title	ECTS
Technical Electives	Automation and Robotics	6
	Geometallurgy	6
	Mechanized Excavation	6
	Advanced Geostatistics	6
	Digital Mine	6

SCHOOL OF MINING AND GEOSCIENCES

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 Chemistry I with Laboratory	8	GEOL 101 Fundamentals of Geology	6
	Kazakh Language	6	PHYS 162 Physics II for Scientists and Engineers with Laboratory	8
	SHSS 150 Rhetoric and Composition	6	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	Structural Mechanics	6
	CHEM 102 General Chemistry II	6	PETE 205 Drilling Engineering with Lab	8
	Writing or Communication course	6	PETE 206 Reservoir Rock Fluid Properties with Lab	8
	Total semester ECTS credits	30	Total semester ECTS credits	34

SCHOOL OF MINING AND GEOSCIENCES

	Fall	ECTS	Spring	ECTS
Year3	PETE 204 Reservoir Engineering I with Lab	8	PETE 307 Production Engineering	6
	PETE 303 Well Logging and Formation Evaluation	6	PETE 306 Reservoir Engineering II	6
	PHIL 210 Ethics	6	GEOL 402 Petroleum Geology	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
Year4	PETE 400 Capstone Design Project I	6	PETE 407 Capstone Design Project II	8
	PETE 401 Reservoir Simulation	6	Technical Elective II	6
	Technical Elective I	6	ECON 323 Managerial Economics	6
	PETE 402 Enhanced Oil Recovery	6	PETE 408 Reservoir Geomechanics	6
	Fundamentals of Entrepreneurship and Management	6		
	Total semester ECTS credits	30	Total semester ECTS credits	24
				Total ECTS credits
				250

SCHOOL OF MINING AND GEOSCIENCES

BS IN GEOLOGY

	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 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
	SHSS 150 Rhetoric and Composition	6	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	ENG 101 Programming for Engineers	6
	GEOL 202 Geologic Maps and Cross-Sections	6	GEOL 204 Paleontology	6
	Kazakh Language	6	GEOL 205 Sedimentology and Stratigraphy	6
	Writing or Communication	6	GEOL 206 Sedimentary Petrology	6
	PHIL 210 Ethics	6	GEOL 207 Field Geology I	6
	Total semester ECTS credits	30	Total semester ECTS credits	30

SCHOOL OF MINING AND GEOSCIENCES

	Fall	ECTS	Spring	ECTS
Year 3	GEOL 301 Igneous and Metamorphic Petrology	6	GEOL 306 Geostatistics	6
	GEOL 302 Thermodynamics and Geochemistry	6	GEOL 307 Geographic Information Systems	6
	GEOL 303 Structural Geology	6	GEOL 308 Hydrogeology	6
	GEOL 304 Geodynamics	6	GEOL 309 Environmental Geochemistry	6
	GEOL 305 Geophysics	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 Geology of Ore Deposits	6	Fundamentals of Entrepreneurship and Management	6
	GEOL 402 Petroleum Geology and Geochemistry	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
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 one four year full-time undergraduate degree program, which is **BSc in Nursing**. For the specific requirements of the program see the degree program below. The Undergraduate Core Curriculum Framework has been incorporated into these programs.

BSc IN NURSING

	Fall	ECTS	Spring	ECTS
Year 1	CHEM 090 Chemistry + Lab	6	NUR 102/L Anatomy and Physiology 2	8
	SHSS 150 Rhetoric and Composition	6	NUR 103/L Microbiology	8
	Kazakh Language	6	HST 100 History of Kazakhstan	6
	NUR 112 Introduction to Nursing	4	Kazakh language	6
	NUR 101/L Anatomy and Physiology 1	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 Therapeutics	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 Practice	6
	Total semester ECTS credits	30	Total semester ECTS credits	32

SCHOOL OF MEDICINE

	Fall	ECTS	Spring	ECTS
Year 3	COMM 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
	GSB Fundamentals of Entrepreneurship and Management	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

FOUR YEAR COURSE PLAN

YEAR 1

FALL				
School	Course #	Course Title	ECTS	Reason for taking
		Total semester ECTS credits		

SPRING				
School	Course #	Course Title	ECTS	Reason for taking
		Total semester ECTS credits		

SUMMER				
School	Course #	Course Title	ECTS	Reason for taking
		Total semester ECTS credits		

FOUR YEAR COURSE PLAN

YEAR 2

FALL				
School	Course #	Course Title	ECTS	Reason for taking
		Total semester ECTS credits		

SPRING				
School	Course #	Course Title	ECTS	Reason for taking
		Total semester ECTS credits		

SUMMER				
School	Course #	Course Title	ECTS	Reason for taking
		Total semester ECTS credits		

FOUR YEAR COURSE PLAN

YEAR 3

FALL				
School	Course #	Course Title	ECTS	Reason for taking
		Total semester ECTS credits		

SPRING				
School	Course #	Course Title	ECTS	Reason for taking
		Total semester ECTS credits		

SUMMER				
School	Course #	Course Title	ECTS	Reason for taking
		Total semester ECTS credits		

FOUR YEAR COURSE PLAN

YEAR4

FALL				
School	Course #	Course Title	ECTS	Reason for taking
		Total semester ECTS credits		

SPRING				
School	Course #	Course Title	ECTS	Reason for taking
		Total semester ECTS credits		

SUMMER				
School	Course #	Course Title	ECTS	Reason for taking
		Total semester ECTS credits		

FOR NOTES

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