COURSE SPECIFICATION FORM,
approved by the Academic Council 17.06.2015 (#39)

SECTION A: DEFINITIVE

Items in this section may be reviewed and developed within Schools as part of the Annual Program Monitoring Process and in line with the Guidelines to Modifications to Programs and Courses.

1.	**General course information**		
1.1	School: SST	1.6	Credits (ECTS): 6
1.2	Course Title: Regression Analysis	1.7	Course Code: MATH 440
1.3	Pre-requisites:	1.8	Effective from: *(year)*
1.4	Co-requisites:		
1.5	Programs: *(in which the course is offered)*	☐ Core	☒ Elective

2.	**Course description (max.150 words)**
The course starts with simple linear regression, diagnostic tests and plots, quality measures, matrix description of regression model. It continues with the multiple regression, predictor subset selection, interactions, variable transformations, use of categorical predictors, model validation, and remedial measures. Some other topics that can be considered (if time permits) are autocorrelation and logistic regression.	

3.	**Summative assessment methods** (tick if applicable)**:**				
3.1	Examination	☒	3.5	Presentation	☐
3.2	Term paper	☐	3.6	Peer-assessment	☐
3.3	Project	☒	3.7	Essay	☐
3.4	Laboratory Practicum	☐	3.8	Other *(specify)*	Homework

4.	**Course aims**
Students will: 1. Use labeled quantitative and categorical data to draw conclusions about real world phenomena using regression methods, 2. Build regression models and validate their quality, 3. Use modern statistical software packages for building statistical models.	

5.	**Course learning outcomes (CLOs)**
5.1	When given observations of two or more variables, the student will be able to: 1. Select appropriate set of predictors, 2. Model numerical response using a single or multiple explanatory variables to investigate relationships between variables, 3. Examine the appropriateness of a regression model and use remedial measures when the model is not appropriate, 4. Interpret modeling results correctly, effectively, and in context without relying on statistical jargon. 5. Prepare reports and presentations with reproducible code.

5.2

CLO ref #	Program Learning Outcome(s) to which CLO is linked	Graduate Attribute(s) to which CLO is linked
1		
2		
3		

SECTION B: NON-DEFINITIVE
Course Syllabus Template

Details of teaching, learning and assessment

Items in this Section should be considered annually (or each time a course is delivered) and amended as appropriate, in conjunction with the Annual Program Monitoring Process. The template can be adapted by Schools to meet the necessary accreditation requirements.

6.	**Detailed course information**		
6.1	Academic Year: 2020-2021	6.3	Schedule (class days, time): MWF 3:00-3:50 pm
6.2	Semester: Spring	6.4	Location (building, room): Zoom

7. Course leader and teaching staff

Position	**Name**	**Office #**	**Contact information**	**Office hours/or by appointment**
Course Leader				
Course Instructor(s)	Zh. Assylbekov		zhassylbekov@nu.edu.kz	T 11-12, 2-3 R 10-12
Teaching Assistant(s)				

8. Course Outline

Session	**Date** tentative	**Topics and Assignments** (chapter numbers are from Kutner et al.)	**Course Aims** (ref. # only, see item 4)	**CLOs**
	Week 1	Ch 1 – Simple Linear Regression (SLR)		
	Week 2	Ch 2 – Inferences in Regression and Correlation Analysis		
	Week 3	Ch 3 – Diagnostics and Remedial Measures		
	Week 4	Ch 4 – Simultaneous Inferences and Other Topics		
	Week 5	Ch 5 – Matrix Approach to SLR Analysis		
	Week 6	**Midterm-1**		
	Week 7	**Project-1**		
	Week 8	Ch 6 – Multiple Linear Regression (MLR) I		
	Week 9	Ch 7 – Multiple Linear Regression (MLR) II		
	Week 10	Ch 8 – MLR for Quantitative and Qualitative Predictors		
	Week 11	Spring Break		
	Week 12	Ch 9 – Model Selection and Validation		
	Week 13	Ch 10 – Diagnostics		
	Week 14	Ch 11 – Remedial Measures		
	Week 15	**Midterm-2**		
	FE Period	**Project-2**		

9.	**Learning and Teaching Methods** (briefly describe the approaches to teaching and learning to be employed in the course)
1	**Homework** will be assigned on a weekly basis. It will not be collected. It serves as preparation for exams (see below).
2	**Attendance/Participation:** During the lectures I will randomly sample students and ask them questions or assign problems. Each sampled student will be asked at least two times throughout the class. A student gets 2 points if he/she is present every time I ask (during one class), regardless

	whether his/her answers/solutions are correct or wrong. A student gets 1 point if he/she misses one or more questions/problems (during one class). Absent students receive 0 points.
3	**Midterm Exams:** These are oral examinations. I will allocate ~30 minutes for each student during the midterm week. In the exam, I will ask questions or assign problems or ask you to show the solutions of HW assignments. Expect 4–5 questions/problems per exam.
4	**Projects**: Projects will be assigned. Details will be provided later, but they will involve obtaining & pre-processing data, fitting models, interpreting results, and writing reports.

10.	**Summative Assessments**			
#	**Activity**	**Date** (tentative)	**Weighting (%)**	**CLOs**
	Attendance/Participation	Weeks 1-15	20	1, 3
	Midterm Exam-1	Week 6	20	1-3
	Project-1	Week 7	20	1-3
	Midterm Exam-2	Week 15	20	1-3
	Project-2	Exam period	20	1, 3

11.	**Grading**	
Letter Grade	**Percent range**	**Grade description** (where applicable)
A	[95, 100]	
A-	[90, 94]	
B+	[85, 89]	
B	[80, 84]	
B-	[75, 79]	
C+	[70, 74]	
C	[65, 69]	
C-	[60, 64]	
D+	[55, 59]	
D	[50, 54]	
F	[0, 49]	

12.	**Learning resources** (use a full citation and where the texts/materials can be accessed)
E-resources, including, but not limited to: databases, animations, simulations, professional blogs, websites, other e-reference materials (e.g. video, audio, digests)	
E-textbooks	
Laboratory physical resources	
Special software programs	R + RStudio
Journals (inc. e-journals)	
Text books	M. H. Kutner et al (2005). Applied Linear Statistical Models, 5th edition
13.	**Course expectations**

Students are expected to actively and positively participate in this class, including (but not limited to):

- Attendance: students must report all absences for health reasons to the Department of Student Affairs.
  - It is the student's responsibility to understand material covered when there is an absence.
  - Students are expected to arrive to class on time.
- Learning: Students are expected to learn all the material in the course. Not all information will be presented in class; therefore, students are expected to study outside of class.
  - Students should allocate at least nine hours a week outside of class for study and improvement.
- Language: English is the official language of instruction for this university; therefore, all work is expected to be done neatly and accurately in English.
- Electronic Devices: All pagers, cell phones or other related electronic personal communication devices must be turned off during a class session.

14.	**Academic Integrity Statement**

Students are required to abide by the Student Code of Conduct and Disciplinary Procedures (approved by the AC on 05.02.2014), specifically, paragraphs 13-16 (plagiarism and cheating). Cheating will not be tolerated. Working in groups on homework problems is encouraged. Talking or looking at your classmate's paper during a quiz/exam is not allowed under any circumstances. All forms of cheating are grounds for a failing grade in the course for all parties involved.

15.	**E-Learning**

16.	**Approval and review**	
Date of Approval:	**Minutes #:**	**Committee:**
Date(s) of Approved Change:	**Minutes #:**	**Committee:**