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МОНГОЛ УЛСЫН ШИНЖЛЭХ УХААН
ТЕХНОЛОГИЙН ИХ СУРГУУЛЬ
MONGOLIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

RTU, FEEE Institute of Industrial Electronics and Electrical Engineering, Riga, Latvia

SMARTCITY: Innovative Approach Towards a Master Program

1-3; 8-9 of April 2021
Virtual (Riga Time)

The workshop in a frame of Activity
3.2 PC teachers' training abroad
598317-EPP-1-2018-1-BG-EPPKA2-CBHE-JP

MUST, Ulaanbaatar, Mongolia

Co-funded by the
Erasmus+ Programme
of the European Union



Partners (Mongolia)

National University of Mongolia (NUM)
Mongolian University of Science and Technology (MUST)
Intec LLC (INTEC)

Partners (Kazakhstan)

Al-Farabi Kazakh National University (KazNU)
L.N. Gumilyov Eurasian National University (ENU)
Kazakhstan Association for Engineering Education (KAZSEE)

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Technical University of Sofia (TUS), Bulgaria

EU Partners

Alexander Technological Educational Institute of Thessaloniki (ATEITH),
Greece
Chemnitz University of Technology (TUC), Germany
Rigas Tehniska Universitate (RTU), Latvia
Asociatia Pentru Tehnologia Informatiei Si Comunicatii Din Rom (ATIC),
Romania

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Yuri Gagarin State Technical University of Saratov (SSTU)
Novosibirsk State Technical University (NSTU)
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APPLICATIONS

SMART CITY

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TEACHINE MATERIAL

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SYLLABUS

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Study programme "Computerised Control of Electrical Technologies"

Main attributes

Title	Computerised Control of Electrical Technologies
Identification code	EMO0
Education classification code	45522
Level and type	Academic Master Study
Higher education study field	Power and Electrical Engineering, Electrical Technologies
Head of the study field	Oskars Krievs
Deputy head of the study field	Pāvels Gavrilovs
Department responsible	Faculty of Electrical and Environmental Engineering
Head of the study programme	Leonīds Ribickis
Professional classification code	
The type of study programme	Full time
Language	Latvian, English
Accreditation	29.05.2013 - 30.06.2022; Accreditation certificate No 2020/40
Volume (credit points)	81.0
Duration of studies (years)	Full time studies - 2.0
Degree or/and qualification to be obtained	Master Degree of Engineering Science in Electrical Science
Qualification level to be obtained	The 7th level of European Qualifications Framework (EQF) and Latvian Qualifications Framework (LOF)
Programme prerequisites	Bachelor Degree of Engineering Science in Electrical Science

Description

Abstract	Within the framework of academic Master studies the students master field-specific theoretical and specialised subjects connected with development and design of different electrical technologies and the methods of their automation. On completion of the studies the students develop and defend a Master Thesis. On successful defence of the Thesis the students are awarded a Master degree in electrical engineering.
Aim	The aim of the academic Master studies is to provide Master level education in electrical engineering, to advance students' knowledge in economics and humanitarian subjects, to develop their skills in solving practical tasks in research and design of electrical technologies and to realize pedagogical work.
Tasks	The main objectives of academic Master studies are the following: -1. to provide advanced knowledge on basic technologies in the field of electric power consumption; -2. to develop understanding of electronic devices and systems elaboration principles; -3. to develop practical skills in design and operation of the objects of computerised control; -4. to enlarge knowledge in economics and social subjects; -5. to develop scientific research skills.
Learning outcomes	The graduates are able: -to design and develop innovative systems of computer control for electro-technical equipment in any branch of economy; -to apply theoretical knowledge for solving of scientific problems; -to design and develop electronic devices, semiconductor power converters and electric drive systems; -to apply computers and software for designing activities, to compile software programmes for control of technology objects; -to apply skills and knowledge in the field of scientific investigation and pedagogical work; -to apply foreign language in the applied scientific field; -to summarize, analyze and prove the results of scientific work; -to complete reports on the research results and write scientific publications. The graduates obtain Master degree in Electrical Engineering.
Final/state examination procedure, assessment	Knowledge in a subject is evaluated by a lecturer responsible for this subject, by means of exam or test according to 10 grade scale. The least successful mark is 4 points. Five study subjects envisage the development of study projects (in curriculum they are marked with letter D). They are defended in the presence of tutors and the board and are evaluated with a mark. Defending of a qualification work, that is, the Master Thesis, is public. It is evaluated by an Examination Commission that consists of at least 3 professors, appointed by the faculty Dean. The volume of the Master Thesis is approximately 50 printed pages with text, schemes and figures. The paper should comprise an investigation of some electrical equipment operation as well as proposals for technical realization of such equipment (schemes, their descriptions, technical documentation of equipment); the formatting of the paper should meet the requirement set in RTU regulations. Each Master paper is evaluated by a reviewer and assessed by the supervisor of the work.
Description of the future employment	The graduates of the study programme can work at any enterprise as highly qualified specialists in the field of electrical technologies and their automation, as well as at scientific research institutions as junior scientific personnel and as teachers at educational institutions.

Courses

No	Code	Name	Credit points
A		Compulsory study courses	43.0
1	EEP584	Theory of Electronic Converters of Electrical Energy	4.0
2	EEP585	Simulation of Electrical Processes	5.0
3	EEP574	Commutated Converters	5.0
4	EEP572	The Control Systems of Power Electronics Equipment	5.0
5	EEP570	Elements of Automatics	9.0
6	EEP433	Automated Electrical Drive	3.0
7	EEP524	Design of Power Electronics Systems	3.0
8	EEP504	Microprocessors - based Automation Systems	3.0
9	EEP582	Control Technique with Microprocessor Controllers	3.0
10	EEP583	Industrial Frequency Converters and Inverters	2.0
11	IDA700	Basics of Labour Protection	1.0
B		Compulsory elective study courses	14.0
B1		Field-specific study course	10.0
1	EEP408	Automated Electrotechnological Processes	2.0
2	EEP430	Industrial Programmable Control Systems	2.0
3	EEP342	Application of Computers in Electrical Equipment Design	2.0
4	EEP319	Methods of Analysis and Calculation of Electronic Circuits	2.0
5	EEP458	Typical Electrical Drive	5.0
6	EEP581	Electro-Magnetic Compatibility in Industrial Electronic Equipment	2.0
7	EEP453	Industrial Electronic Equipment	4.0
8	EEP345	Unconventional Systems of Energy Conversion and Accumulation	3.0
9	EES162	High Voltage Engineering	3.0
B2		Humanities and social sciences study courses	2.0
1	HSP483	Industrial Relations	2.0
2	HSP488	Business Sociology	2.0
3	HSP430	Social Psychology	2.0
4	HSP446	Pedagogy	2.0
B3		Economics and management study courses	2.0
1	IUE217	Business Economics	2.0
2	IUE308	Entrepreneurship Planning	2.0
3	IRO313	Organization of Production	2.0
C		Free elective study courses	4.0
E		Final examination	20.0
1	EEI002	Master Thesis	20.0
2	EEL002	Master Thesis	20.0
3	EEP002	Master Thesis	20.0

A. Compulsory study courses

Courses

No	Code	Name	Credit points
A		Compulsory study courses	43.0
1	EEP584	Theory of Electronic Converters of Electrical Energy	4.0
2	EEP585	Simulation of Electrical Processes	5.0
3	EEP574	Commutated Converters	5.0
4	EEP572	The Control Systems of Power Electronics Equipment	5.0
5	EEP570	Elements of Automatics	9.0
6	EEP433	Automated Electrical Drive	3.0
7	EEP524	Design of Power Electronics Systems	3.0
8	EEP504	Microprocessors - based Automation Systems	F.EE714 Microprocessors – based Automation System 3
9	EEP582	Control Technique with Microprocessor Controllers	F.EE715 Control Technique with Microprocessor Controllers 3
10	EEP583	Industrial Frequency Converters and Inverters	2.0
11	IDA700	Basics of Labour Protection	F.CN725 Basics of Occupational Safety 1



Code	Subject	Credit Points	ECTS	University	Semester
A COMPULSORY COURSES 43 CP/ 64.5 ECTS					
EEP584	Theory of Electronic Converters of Electrical Energy	4	6	RTU	I
EEP585	Simulation of Electrical Processes	5	7.5	RTU	I
EEP574	Commutated Converters	5	7.5	RTU	II
EEP572	The Control Systems of Power Electronics Equipment	5	7.5	RTU	I
EEP570	Elements of Automatics	9	13.5	RTU	II
EEP433	Automated Electrical Drive	3	4.5	RTU	I
EEP524	Design of Power Electronics Systems	3	4.5	RTU	II
F.EE714	Microprocessors – based Automation System	3	4.5	MUST,NUM	III
F.EE715	Control Technique with Microprocessor Controllers	3	4.5	MUST,NUM	III
EEP583	Industrial Frequency Converters and Inverters	2	3	RTU	I
F.CN725	Basics of Occupational Safety	1	1.5	MUST,NUM	III

B. Compulsory elective study courses

B		Compulsory elective study courses				14.0
B1		Field-specific study course				10.0
1	EEP408	Automated Electrotechnological Processes				2.0
2	EEP430	Industrial Programmable Control Systems				2.0
3	EEP342	Application of Computers in Electrical Equipment Design				2.0
4	EEP319	Methods of Analysis and Calculation of Electronic Circuits				2.0
5	EEP458	Typical Electrical Drive				5.0
6	EEP581	Electro-Magnetic Compatibility in Industrial Electronic Equipment				2.0
7	EEP453	Industrial Electronic Equipment	U.SC705	Fundamental of Smart city		2
8	EEP345	Unconventional Systems of Energy Conversion and Accumulation	J.EE703	Digital Signal Processing		3
9	EES162	High Voltage Engineering	J.EE702	Semiconductor IC Technology		3
B2		Humanities and social sciences study courses				2.0
1	HSP483	Industrial Relations	U.SC810	Internship	10	2.0
2	HSP488	Business Sociology				2.0
3	HSP430	Social Psychology				2.0
4	HSP446	Pedagogy				2.0
B3		Economics and management study courses				2.0
1	IUE217	Business Economics				2.0
2	IUE308	Entrepreneurship Planning	U.SC810	Internship	10	2.0
3	IRO313	Organization of Production				2.0

B LIMITED CHOICE 14.0 CP / 21.0 ECTS

B1 Specialized courses 10.0 CP/ 15.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
EEP408	Automated Electro Technological Processes	2	3		
EEP430	Industrial Programmable Control Systems	2	3		
EEP342	Application of Computers in Electrical Equipment Design	2	3		
EEP319	Methods of Analysis and Calculation of Electronic Circuits	2	3		
EEP458	Typical Electrical Drive	5	7.5		
EEP581	Electro-Magnetic Compatibility in Industrial Electronic Equipment	2	3		
EEP453	Industrial Electronic Equipment	4	6		
EEP345	Unconventional Systems of Energy Conversion and Accumulation	3	4.5		
EES162	High Voltage Engineering	3	4.5		
J.EE702	Semiconductor IC Technology	3	4.5	MUST	III
J.EE703	Digital Signal Processing	3	4.5	MUST	III
U.SC705	Fundamental of Smart city	2	3	MUST	III
ICSI612	Artificial Intelligence and Machine Learning	2	3	NUM	III
ICSI612	Data mining	2	3	NUM	III
ICSI622	Advanced Topics in Information Security	2	3	NUM	III
ICSI600	Research Methodologies in Computer Science	1	1.5	NUM	III

B	
B1	
1	EEP408
2	EEP430
3	EEP342
4	EEP319
5	EEP458
6	EEP581
7	EEP453
8	EEP345
9	EES162
B2	
1	HSP483
2	HSP488
3	HSP430
4	HSP446
B3	
1	IUE217
2	IUE308
3	IRO313

C. Free elective study courses

C		Free elective study courses	U.SC810	Internship	10	4.0
E		Final examination				20.0
1	EEI002	Master Thesis				20.0
2	EEL002	Master Thesis				20.0
3	EEP002	Master Thesis				20.0

U.SC810	Internship	10	15	MUST	IV
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B2 Humanities and social sciences 2.0 CP/ 3.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
HSP483	Industrial Relations	2	3	MUST	IV

B3 Economics and management study courses 2.0 CP/ 3.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
IUE308	Entrepreneurship Planning	2	3	MUST	IV

C Free Choice Courses 4.0 CP/ 6.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
U.SC910	Smart City and IC Technology	6	9	MUST	IV

E Final Examination 20.0 CP/ 30.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
-	Master Thesis	20	30	RTU MUST	IV



Сургалт / ОЮУТАН / Оюутны дэлгэрэнгүй мэдээлэл

Оюутны бүртгэл



Сургууль: **Мэдээлэл, холбооны технологийн сургууль**
Салбар/Тэнхим: **Электроникийн салбар**
Мэргэжил: **ЭЛЕКТРОНИК**
Голч дүн: **3.4**
Нийт цуглуулсан кредит: **13**

Оюутны код: **J.EE19E006**
Оюутны овог нэр: **ГАНБААТАР БИЛГҮҮН**
Регистр: **УУ92050879**
Гэрийн хаяг:
Суралцаж буй төлөв: **Суралцаж буй**

Student ID
Ganbaatar Bilguun

Оюутны дүнгийн мэдээлэл



№	Subject code Хичээлийн код	Subject name Хичээлийн нэр	Credit Unit Кредит	Lecturer's score Багшийн оноо	Exam score Шалгалтын оноо	Total score Нийт оноо	Mark Үнэлгээ
1	J.EE702	Semiconductor IC Technology Хагас дамжуулагч интеграл схемийн технологи	3	61	26	87	B
2	J.EE703	Digital Signal Processing Тоон дохионы боловсруулалт	3	65	18	83	B-
3	F.CN725	Basics of Occupational Safety Аюулгүй ажиллагааны үндэс	1	68	30	98	A
4	F.EE714	Microprocessors based Automation Systems Микропроцессорт суурилсан автоматжуулалтын систем	3	65	26	91	A-
5	F.EE715	Control Technique with Microprocessor Controllers Микроконтроллерт суурилсан удирдлагын арга	3	68	30	98	A

НИЙТ

Total Credit: **13**
ECTS: 19.5 Cu

GPA: **3.4**


G.Bilguun
Student ID: **J.EE19E006**

The thesis topic:
Smart trash bin

Supervisor from MUST:
Dr.Tengis

Student Information Page of Management Information System at the MUST

Оюутны бүртгэл

Зураг

Сургууль: Мэдээлэл, холбооны технологийн сургууль

Салбар/Тэнхим: Электроникийн салбар

Мэргэжил: ЭЛЕКТРОНИК

Голч дүн: 3.8

Нийт цуглуулсан кредит: 30

Оюутны код: J.EE18E021

Оюутны овог нэр: ДОВДОН ТЭНҮҮН

Регистр: ГМ92101008

Гэрийн хаяг:

Суралцаж буй төлөв: Суралцаж буй

Student ID
Dovdon
Tenuun

Оюутны дүнгийн мэдээлэл							
№	Subject code Хичээлийн код	Subject name Хичээлийн нэр	Credit Unit Кредит	Lecturer's score Багшийн оноо	Exam score Шалгалтын оноо	Total score Нийт оноо	Mark Үнэлгээ
1	S.CS710	Инженерийн загварчлал	2	70	28	98	A
2	S.IP710	Патент судлал	1	70	29	99	A
3	S.PS710	Судалгаа шинжилгээний арга зүй	1	65	28	93	A-
4	J.EE702	Semiconductor IC Technology Хагас дамжуулагч интеграл схемийн технологи	3	70	29	99	A
5	J.EE703	Digital Signal Processing Тоон дохионы боловсруулалт	3	65	15	80	C+
6	F.CN725	Basics of Occupational Safety Аюулгүй ажиллагааны үндэс	1	70	30	100	A
7	F.EE714	Microprocessors based Automation Systems Микропроцессорт суурилсан автоматжуулалтын систем	3	68	28	96	A
8	F.EE715	Control Technique with Microprocessor Controllers Микроконтроллерт суурилсан удирдлагын арга	3	68	30	98	A
9	G.IA701	Дэвшилтэт мехатроник I	ECTS: 19.5 Cu		25	92	A-
10	G.IA703	Инженерийн тооцооны програмчлал	3	70	27	97	A
11	G.IA704	Дүрс боловсруулалт	3	70	27	97	A
12	G.IA707	Судалгааны ажлын семинар I	1	70	28	98	A
13	G.IA714	Роботын кинематик, динамик	3	70	30	100	A
НИЙТ			Total Credit: 30	GPA: 3.8			

Student: D.Tenuun
Student ID: J.EE18E021

The thesis topic:
Charging/discharging the electrochemical battery in residential energy storage

Supervisor from MUST:
Prof.Chuluunbandi



Сургалт / ОЮУТАН / Оюутны дэлгэрэнгүй мэдээлэл

Оюутны бүртгэл



Сургууль: Мэдээлэл, холбооны технологийн сургууль

Салбар/Тэнхим: Электроникийн салбар

Мэргэжил: ЭЛЕКТРОНИК

Голч дүн: 3.7 GPA

Нийт цуглуулсан кредит: 13

Оюутны код: J.EE19E003

Оюутны овог нэр: БАТМӨНХ
ЭРХБАЯР

Регистр: 0095080413

Гэрийн хаяг:

Суралцаж буй төлөв: Суралцаж буй

Student ID

**Batmunkh
Erkhbayar**

B.Erkhbayar
Student ID: J.EE19E003

The thesis topic:
**Development of a
mobile-robot test
bench with different
control systems**

Supervisor from MUST:
Dr.Luubaatar

Оюутны дүнгийн мэдээлэл



№	Subject code Хичээлийн код	Subject name Хичээлийн нэр	Credit Unit Кредит	Lecturer's score Багшийн оноо	Exam score Шалгалтын оноо	Total score Нийт оноо	Mark Үнэлгээ
1	J.EE702	Semiconductor IC Technology Хагас дамжуулагч интеграл схемийн технологи	3	68	29	97	A
2	J.EE703	Digital Signal Processing Тоон дохийны боловсруулалт	3	65	16	81	B-
3	F.CN725	Basics of Occupational Safety Аюулгүй ажиллагааны үндэс	1	70	30	100	A
4	F.EE714	Microprocessors based Automation Systems Микропроцессорт суурилсан автоматжуулалтын систем	3	68	30	98	A
5	F.EE715	Control Technique with Microprocessor Controllers Микроконтроллерт суурилсан удирдлагын арга	3	68	30	98	A

НИЙТ

Total Credit: 13
ECTS: 19.5 Cu

GPA: 3.7

Student: **Dovdon Tenuun**
 Student Card Nr.: **190AEM045**
 Personal ID No.: **326285-35585**
 Study program: **AEM00 Computerised Control of Electrical Technologies: 1, 2, 3, 4 sem.**
 Study type: **Mobility**

Programme courses and their characteristics

Nr.	Code	Course	Credit points	ECTS	Grade	Date
A section (compulsory)			43.0			
1.	EEP570	Elements of Automatics	9.0	13.5	8	03.01.2020
2.	EEP584	Theory of Electronic Converters of Electrical Energy	4.0	6.0	9	14.01.2020
3.	EEP572	The Control Systems of Power Electronics Equipment	5.0	7.5	9	17.01.2020
4.	EEP433	Automated Electrical Drive	3.0	4.5	8	17.01.2020
5.	EEP585	Simulation of Electrical Processes	5.0	7.5	9	24.01.2020
6.	EEP524	Design of Power Electronics Systems	3.0	4.5	9	09.04.2020
7.	EEP583	Industrial Frequency Converters and Inverters	2.0	3.0	9	02.06.2020
8.	EEP574	Commutated Converters	5.0	7.5	10	09.06.2020
9.	EEP582	Control Technique with Microprocessor Controllers	3.0	4.5	recognised	08.02.2021
10.	EEP504	Microprocessors - based Automation Systems	3.0	4.5	recognised	08.02.2021
11.	IDA700	Basics of Labour Protection	1.0	1.5	recognised	08.02.2021
B section (electives)			8.0			
12.	EEP581	Electro-Magnetic Compatibility in Industrial Electronic Equipment	2.0	3.0	9	21.05.2020
13.	EES162	High Voltage Engineering	3.0	4.5	recognised	08.02.2021
14.	EEP345	Unconventional Systems of Energy Conversion and Accumulation	3.0	4.5	recognised	08.02.2021
C section (free option)			4.0	82.5		
15.	IUE217	Business Economics	2.0	3.0	0	
16.	HSP483	Industrial Relations	2.0	3.0	0	
Total			55.0	82.5		

Additional Information

Work volume on programme in credit points:

1 credit point = 1 week study work = 40 hours; practice, practical work - 2 weeks; 20 weeks per semester, 2 semesters per year.

Mark range

From 10 to 1 (10 - highest mark, 4 - lowest successful). For test: passed or failed.

Notations: 10-with distinction; 6-almost good;
 9-excellent; 5-satisfactory;
 8-very good; 4-almost satisfactory;
 7-good; 3-1 - unsatisfactory;

24.02.2021

Student: D.Tenuun Student ID: **J.EE18E021**

The thesis topic: **Charging/discharging the electrochemical battery in residential energy storage**

Supervisor from MUST: Prof.Chuluunbandi

U.SC810	Internship	10	15	MUST	IV
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B2 Humanities and social sciences 2.0 CP/ 3.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
HSP483	Industrial Relations	2	3	MUST	IV

B3 Economics and management study courses 2.0 CP/ 3.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
IUE308	Entrepreneurship Planning	2	3	MUST	IV

C Free Choice Courses 6.0 CP/ 9.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
U.SC821	Smart City and IC Technology	6	9	MUST	IV

U.SC705	Fundamental of Smart city	2	3	MUST	III
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Student: **Batmunkh Erkhbayar**
 Student Card Nr.: **190AEM044**
 Personal ID No.: **327568-00072**
 Study program: **AEMO0 Computerised Control of Electrical Technologies: 1, 2, 3, 4 sem.**
 Study type: **Mobility**

Programme courses and their characteristics

Nr.	Code	Course	Credit points	ECTS	Grade	Date
A section (compulsory)			43.0			
1.	EEP570	Elements of Automatics	9.0	13.5	9	03.01.2020
2.	EEP584	Theory of Electronic Converters of Electrical Energy	4.0	6.0	9	14.01.2020
3.	EEP572	The Control Systems of Power Electronics Equipment	5.0	7.5	9	17.01.2020
4.	EEP433	Automated Electrical Drive	3.0	4.5	9	17.01.2020
5.	EEP585	Simulation of Electrical Processes	5.0	7.5	8	24.01.2020
6.	EEP524	Design of Power Electronics Systems	3.0	4.5	9	09.04.2020
7.	EEP583	Industrial Frequency Converters and Inverters	2.0	3.0	9	02.06.2020
8.	EEP574	Commutated Converters	5.0	7.5	10	09.06.2020
9.	EEP582	Control Technique with Microprocessor Controllers	3.0	4.5	recognised	08.02.2021
10.	EEP504	Microprocessors - based Automation Systems	3.0	4.5	recognised	08.02.2021
11.	IDA700	Basics of Labour Protection	1.0	1.5	recognised	08.02.2021
B section (electives)			8.0			
12.	EEP581	Electro-Magnetic Compatibility in Industrial Electronic Equipment	2.0	3.0	7	21.05.2020
13.	EES162	High Voltage Engineering	3.0	4.5	recognised	08.02.2021
14.	EEP345	Unconventional Systems of Energy Conversion and Accumulation	3.0	4.5	recognised	08.02.2021
C section (free option)			4.0	82.5		
15.	IUE217	Business Economics	2.0	3.0	0	
16.	HSP483	Industrial Relations	2.0	3.0	0	
Total			55.0	82.5		

Additional Information

Work volume on programme in credit points:

1 credit point = 1 week study work = 40 hours; practice, practical work - 2 weeks; 20 weeks per semester, 2 semesters per year.

Mark range

From 10 to 1 (10 - highest mark, 4 - lowest successful). For test: passed or failed.

Notations:

10-with distinction;	6-almost good;
9-excellent;	5-satisfactory;
8-very good;	4-almost satisfactory
7-good;	3-1 - unsatisfactory;

24.02.2021



МОНГОЛ УЛСЫН ШИНЖЛЭХ УХААН
 ТЕХНОЛОГИЙН ИХ СУРГУУЛЬ
 MONGOLIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

B.Erkhbayar Student ID: J.EE19E003

The thesis topic:

Development of a mobile-robot test bench with different control systems

Supervisor from MUST: Dr.Luubaatar

U.SC810	Internship	10	15	MUST	IV
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B2 Humanities and social sciences 2.0 CP/ 3.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
HSP483	Industrial Relations	2	3	MUST	IV

B3 Economics and management study courses 2.0 CP/ 3.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
IUE308	Entrepreneurship Planning	2	3	MUST	IV

C Free Choice Courses 6.0 CP/ 9.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
U.SC821	Smart City and IC Technology	6	9	MUST	IV

U.SC705	Fundamental of Smart city	2	3	MUST	III
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Student: **Ganbaatar Bilguun**
 Student Card Nr.: **190AEM043**
 Personal ID No.: **327057-52402**
 Study program: **AEMO0 Computerised Control of Electrical Technologies: 1, 2, 3, 4 sem.**
 Study type: **Mobility**

Programme courses and their characteristics

Nr.	Code	Course	Credit points	ECTS	Grade	Date
A section (compulsory)			43.0			
1.	EEP570	Elements of Automatics	9.0	13.5	8	03.01.2020
2.	EEP584	Theory of Electronic Converters of Electrical Energy	4.0	6.0	9	14.01.2020
3.	EEP572	The Control Systems of Power Electronics Equipment	5.0	7.5	9	17.01.2020
4.	EEP433	Automated Electrical Drive	3.0	4.5	9	17.01.2020
5.	EEP585	Simulation of Electrical Processes	5.0	7.5	9	24.01.2020
6.	EEP524	Design of Power Electronics Systems	3.0	4.5	0	09.04.2020
7.	EEP583	Industrial Frequency Converters and Inverters	2.0	3.0	0	02.06.2020
8.	EEP574	Commutated Converters	5.0	7.5	9	09.06.2020
9.	EEP582	Control Technique with Microprocessor Controllers	3.0	4.5	recognised	08.02.2021
10.	EEP504	Microprocessors - based Automation Systems	3.0	4.5	recognised	08.02.2021
11.	IDA700	Basics of Labour Protection	1.0	1.5	recognised	08.02.2021
B section (electives)			8.0			
12.	EEP581	Electro-Magnetic Compatibility in Industrial Electronic Equipment	2.0	3.0	0	21.05.2020
13.	EES162	High Voltage Engineering	3.0	4.5	recognised	08.02.2021
14.	EEP345	Unconventional Systems of Energy Conversion and Accumulation	3.0	4.5	recognised	08.02.2021
C section (free option)			4.0	82.5		
15.	IUE217	Business Economics	2.0	3.0	0	
16.	HSP483	Industrial Relations	2.0	3.0	0	
Total			55.0	82.5		

Additional Information

Work volume on programme in credit points:

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10-with distinction;	6-almost good;
9-excellent;	5-satisfactory;
8-very good;	4-almost satisfactory
7-good;	3-1 - unsatisfactory;

G.Bilguun Student ID: **J.EE19E006**

The thesis topic:

Smart trash bin Supervisor from MUST: Dr.Odgerel

U.SC810	Internship	10	15	MUST	IV
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B2 Humanities and social sciences 2.0 CP/ 3.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
HSP483	Industrial Relations	2	3	MUST	IV

B3 Economics and management study courses 2.0 CP/ 3.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
IUE308	Entrepreneurship Planning	2	3	MUST	IV

C Free Choice Courses 6.0 CP/ 9.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
U.SC821	Smart City and IC Technology	6	9	MUST	IV

U.SC705	Fundamental of Smart city	2	3	MUST	III
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RTU from Professor Nadezhda Kunicina:

Kursa kods	Kursa nosaukums	KP	Kursa kods RTU	Kursa nosaukums RTU	KP	A/B1/B2/C/E daļa	Semestris
J.EE702	Semiconductor IC Technology	3.0	EES162	High Voltage Engineering	3	B1	3.
J.EE703	Digital Signal Processing	3.0	EEP345	Unconventional Systems of Energy Conversion and Accumulation	3	B1	3.
ICSI621	Artificial Intelligence and Machine Learning	2.0	EEP504	Microprocessors - based Automation Systems	3	B1	3.
ICSI612	Data mining	2.0	EEP582	Control Technique with Microprocessor Controllers	3	B1	3.
ICSI622	Advanced Topics in Information Security	2.0	EEP319	Methods of Analysis and Calculation of Electronic Circuits	2	B1	3.
ICSI600	Research Methodologies in Computer Science	1.0	IUE308	Entrepreneurship Planning 2.0	2	B3	3.
	Internship	10.0		C Free elective study courses 4.0; IUE217 Business Economics 2.0; 1 HSP483 Industrial Relations 2.0		C	4.

RTU from Professor Nadezhda Kunicina:

			A	B1	B2	B3	C	E
Otgon Dariimaa	190AEM040	National Univeristy of Mongolia	TRŪKST IDA700 Darba aizsardzības pamati (1KP)	TRŪKST 1KP	TRŪKST 2KP	OK	Iepļānoti, bet nav skaidrs ar ko atzīsim	nav skaidrs ar ko atzīsim
Buyanjargal Nyamkhuu	190AEM042	National Univeristy of Mongolia	TRŪKST IDA700 Darba aizsardzības pamati (1KP)	TRŪKST 1KP	TRŪKST 2KP	OK	Iepļānoti, bet nav skaidrs ar ko atzīsim	nav skaidrs ar ko atzīsim
Bud Bayarjargal	190AEM041	National Univeristy of Mongolia	TRŪKST IDA700 Darba aizsardzības pamati (1KP)	TRŪKST 1KP	TRŪKST 2KP	OK	Iepļānoti, bet nav skaidrs ar ko atzīsim	nav skaidrs ar ko atzīsim
Ganbaatar Bilguun	190AEM043	The Mongolian University of Science and Technology	OK, tikai 2 kursos RTU 19/20P nav vērtējumi	TRŪKST 2KP, EEP581 no 19/20P nav vērtējuma	U.SC810 Internship			10
Batmunkh Erkhbayar	190AEM044	The Mongolian University of Science and Technology	OK	TRŪKST 2KP	TRŪKST 2KP	TRŪKST 2KP	Iepļānoti, bet nav skaidrs ar ko atzīsim	nav skaidrs ar ko atzīsim
Dovdon Tenuun	190AEM045	The Mongolian University of Science and Technology	OK	TRŪKST 2KP	TRŪKST 2KP	TRŪKST 2KP	Iepļānoti, bet nav skaidrs ar ko atzīsim	nav skaidrs ar ko atzīsim
U.SC705 Fundamental of Smart city					2	3	MUST	III



U.SC810	Internship	10	15	MUST	IV
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B2 Humanities and social sciences 2.0 CP/ 3.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
HSP483	Industrial Relations	2	3	MUST	IV

B3 Economics and management study courses 2.0 CP/ 3.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
IUE308	Entrepreneurship Planning	2	3	MUST	IV

C Free Choice Courses 6.0 CP/ 9.0 ECTS

Code	Subject	Credit Points	ECTS	University	Semester
U.SC821	Smart City and IC Technology	6	9	MUST	IV

B	
B1	
1	EEP408
2	EEP430
3	EEP342
4	EEP319
5	EEP458
6	EEP581
7	EEP453
8	EEP345
9	EES162
B2	
1	HSP483
2	HSP488
3	HSP430
4	HSP446
B3	
1	IUE217
2	IUE308
3	IRO313

RTU Course "Entrepreneurship Planning"

22701 null

General data

Code	IUE308
Course title	Entrepreneurship Planning
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Undergraduate Studies
Course type	Academic
Field of study	Economics
Responsible instructor	Irina Voronova
Academic staff	Jānis Mežs
Volume of the course: parts and credits points	1 part, 2.0 Credit Points, 3.0 ECTS credits
Language of instruction	LV, EN
Annotation	Essence and principles of planning. Planning methodology. Planning methods, graphical methods, balance methods etc. Network planning methods. Experts method. Normative method. Standard plans. Pricing conditions of the market economy. Elaboration of a business plan. P establishment.
Goals and objectives of the course in terms of competences and skills	To provide the knowledge of business planning and its methodology. The course implementation tasks – to acquire the basis of program production planning, business plan development methodology and its
Structure and tasks of independent studies	Organization and structure of independent studies. Topic – The topic of independent work – The type of independent work 1. The essence of planning; Methods used in planning; Tasks, case studies 2. Business fundamentals and functions; Preconditions for starting a business 3. Fixed asset planning. Information processing and calculation; Tasks 4. Planning the material and labour resources in production, Assessment required; Tasks. 5. Expenditure and performance calculation, Prime cost and price planning 6. Investment planning, Investment efficiency evaluation; Tasks. 7. Business plan content and design, Financial estimates of the plan;
Recommended literature	Pamatliteratūra 1. Alsipā, R., Gertners, G. (2005) Uzņēmējdarbības plānošanas principi. Rīga: RTU, 2005. 229 lpp. 2. Abrams, R. (2010). Successful Business Plan: Secrets & Strategies. Rīga: DCS, 604 lpp. 3. Hofš K. G. (2019). Biznesa ekonomika. Rīga: DCS, 604 lpp. 4. Muška, A. Uzņēmējdarbības plānošana. Rīga: KIF "Biznesa Komplekss", 2005. 96 lpp. Papildliteratūra 5. Cowher S. J. O., Dickson L. S. (2010). Effective Planning Strategies and Proposal Writing: A Workbook for Helping Professionals. Lanham, Maryland: UPA. 6. Caune, J., Dziedons, A. (2009). Stratēģiskā vadīšana. Rīga: Lidojošā zivs, 2009. 383 lpp.
Course prerequisites	Economics or Business economics.

Course outline

Theme	Hours
1. Introduction.	2
2. The fundamentals of planning.	2
3. Types of plans and planning.	2
4. The sequence of planning.	2
5. Business nature and functions.	4
6. The fundamentals of production planning.	10
7. Basic questions of production planning.	4
8. Budget planning.	2
9. The content and design of a business plan.	12

Learning outcomes and assessment

Learning outcomes	Assessment methods
In-depth knowledge about the nature and importance of planning in business.	Test about the questions of the introductory course and practical work.
Ability to independently use methods and problem solving skills in order to solve the main problems of production planning.	Practical group works, exam work.
Ability to define and critically analyze problems in the field of business planning, justify the solutions and decisions.	Practical group works, case study.

Ability to evaluate budget planning, reports and financial reporting.	Independent work, exam work.
Ability to justify the main parts of business plan development and integrate knowledge and skills in the companies plan evaluation.	Development of business plan and presentation.

Study subject structure

Part	CP	Hours per Week			Tests		
		Lectures	Practical	Lab.	Test	Exam	Work
1.	2.0	1.0	0.0	1.0		*	

RTU Course "Industrial Relations"

23101 mll

General data

Code	HSP483
Course title	Industrial Relations
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Undergraduate Studies
Course type	Academic
Field of study	Social Science
Responsible instructor	Gunārs Ozolzīle
Volume of the course: parts and credits points	1 part, 2.0 Credit Points, 3.0 ECTS credits
Language of instruction	LV, EN
Annotation	The theoretical foundations of industrial relations are mastered in th for their practical organization are developed. The essence, compon of industrial relations are described. Different systems of industrial are mastered. Special attention is paid to the organization of industr assessment.
Goals and objectives of the course in terms of competences and skills	The aim of the study course is to provide the necessary basic compe organizing industrial relations. The tasks of the study course. 1. To industrial relations, regularities and principles of operation. 2. To ac industrial relations in order to develop knowledge about the possibi use of human resources.
Structure and tasks of independent studies	The following independent works are provided for the acquisition o literature studies. 2. Situation analysis. 3. Preparing for exercises an
Recommended literature	Obligātā/Obligatory: 1. Garleja R., Vidnere M. Psiholoģijas un sociālās uzvedības aspekt 2000. 2. Industriālās attiecības. Mācību metodiskie materiāli. Rīga: RTU, 3. Brewster C., Hegewisch A. Policy and Practice in European Hum London: Routledge, 2004. 4. Ferner A., Hyman R. Industrial Relations in the New Europe. Ox 5. Schuler R.S. Managing Human Resources. St. Paul, MN: West F Papildu/Additional: 1. Bean R. Comparative Industrial Relations. An Introduction to Cr Routledge, 2020. 2. Colling T., Terry M. (Eds.) Industrial Relations: Theory and Practice. Wiley-Blackwell, 2010. 3. Bray M., Waring P., Cooper R., Macneil J. Employment Relations. Sydney: McGraw-Hill, 2017.
Course prerequisites	Not necessary.

Course outline

Theme	Hours
The essence of industrial relations. The historical development of the industrial relations.	4
Managing the human resources development and the human capital.	6
Social-psychological aspects of the industrial relations.	6
The different models of the industrial relations in the world (Europe, USA, Japan).	6
Industrial democracy and labour ethics.	6
Industrial conflicts and how to overcome them.	6
The social and labour legislation.	4
The final test.	2

Learning outcomes and assessment

Learning outcomes	Assessment methods
Is able to assess the essence of industrial relations, compare and characterize the different practical systems.	Discussions in seminars, exercises, diagnostic tests and tests.
Understands the specifics of the industrial relations in Latvia.	Discussions in seminars, exercises, diagnostic tests and tests.
Knows the structure of social organizations, knows their components and interrelationships.	Discussions in seminars, exercises, diagnostic tests and tests.
Is able to characterize the tendencies of the human resources and capital development.	Discussions in seminars, exercises, diagnostic tests and tests.
Is able to participate in argumentative discussions and debates on the industrial relations problems in Latvia and has the skills to assess possibilities of their professional career.	Discussions in seminars, exercises, diagnostic tests and tests.

Is able to diagnose the social problems of organizations and create the development module.	Discussions in seminars, exercises, diagnostic tests and tests.
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Study subject structure

Part	CP	Hours per Week			Tests		
		Lectures	Practical	Lab.	Test	Exam	Work
1.	2.0	1.0	1.0	0.0	*		

Award Criteria

Relevance of the project

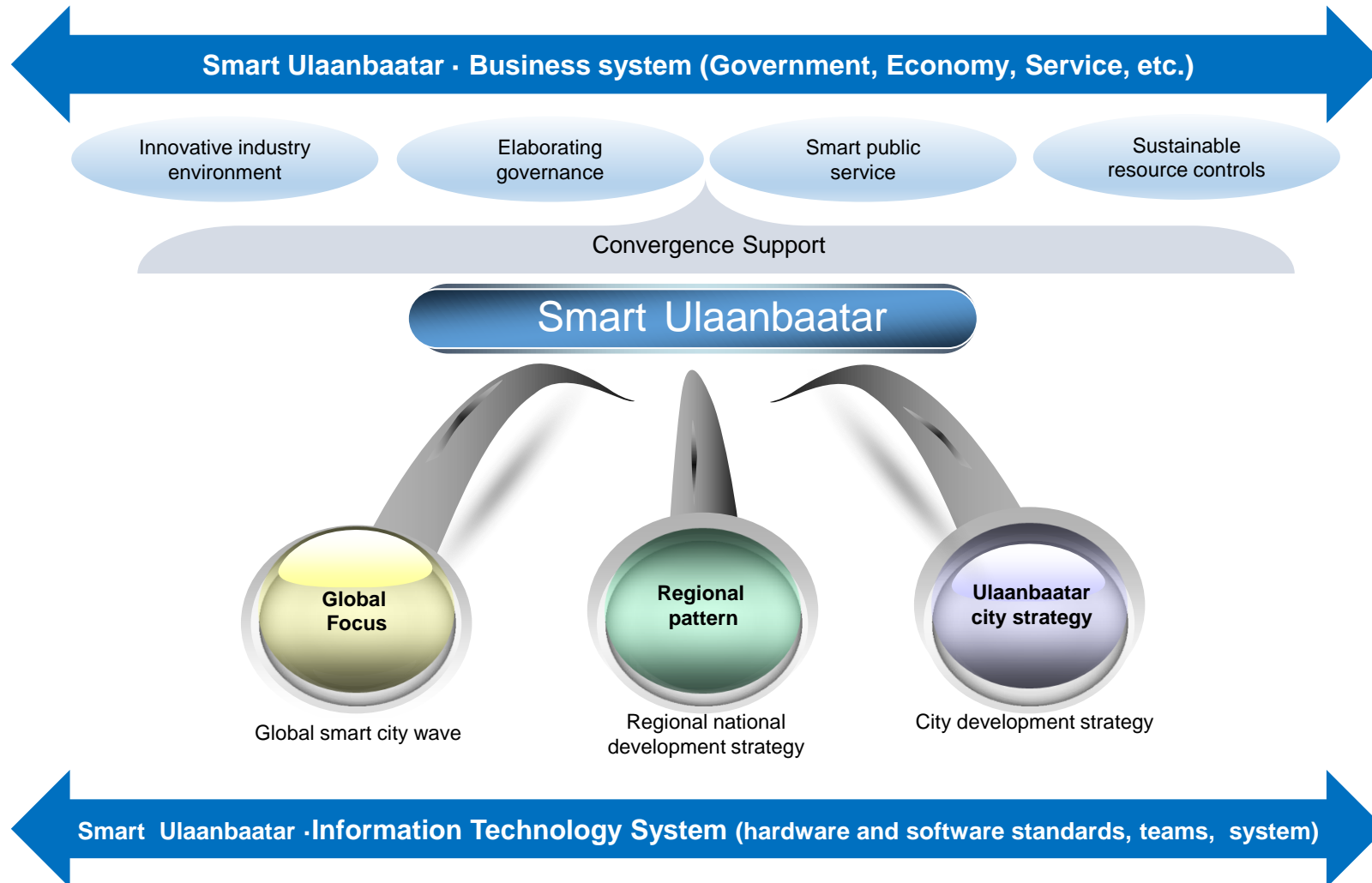


Proposal number:	598317-EPP-1-2018-1-BG-EPPKA2-CBHE-JP
Proposal title:	SMARTCITY: Innovative Approach Towards A Master Program On Smart Cities Technologies
Applicant organisation:	TECHNICAL UNIVERSITY OF SOFIA

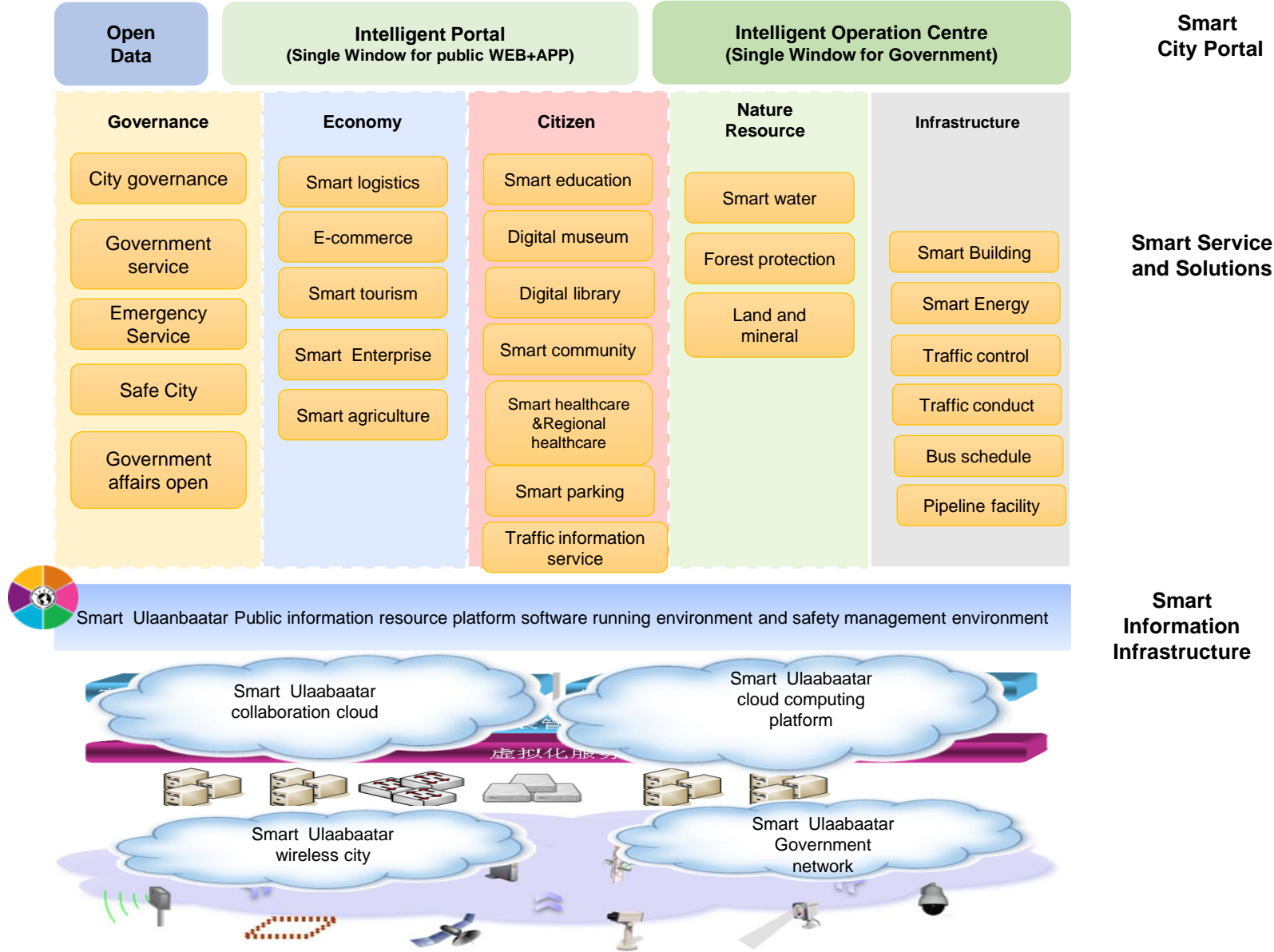
SMART ULAANBAATAR IT MASTER PLAN PROJECT

November 2015

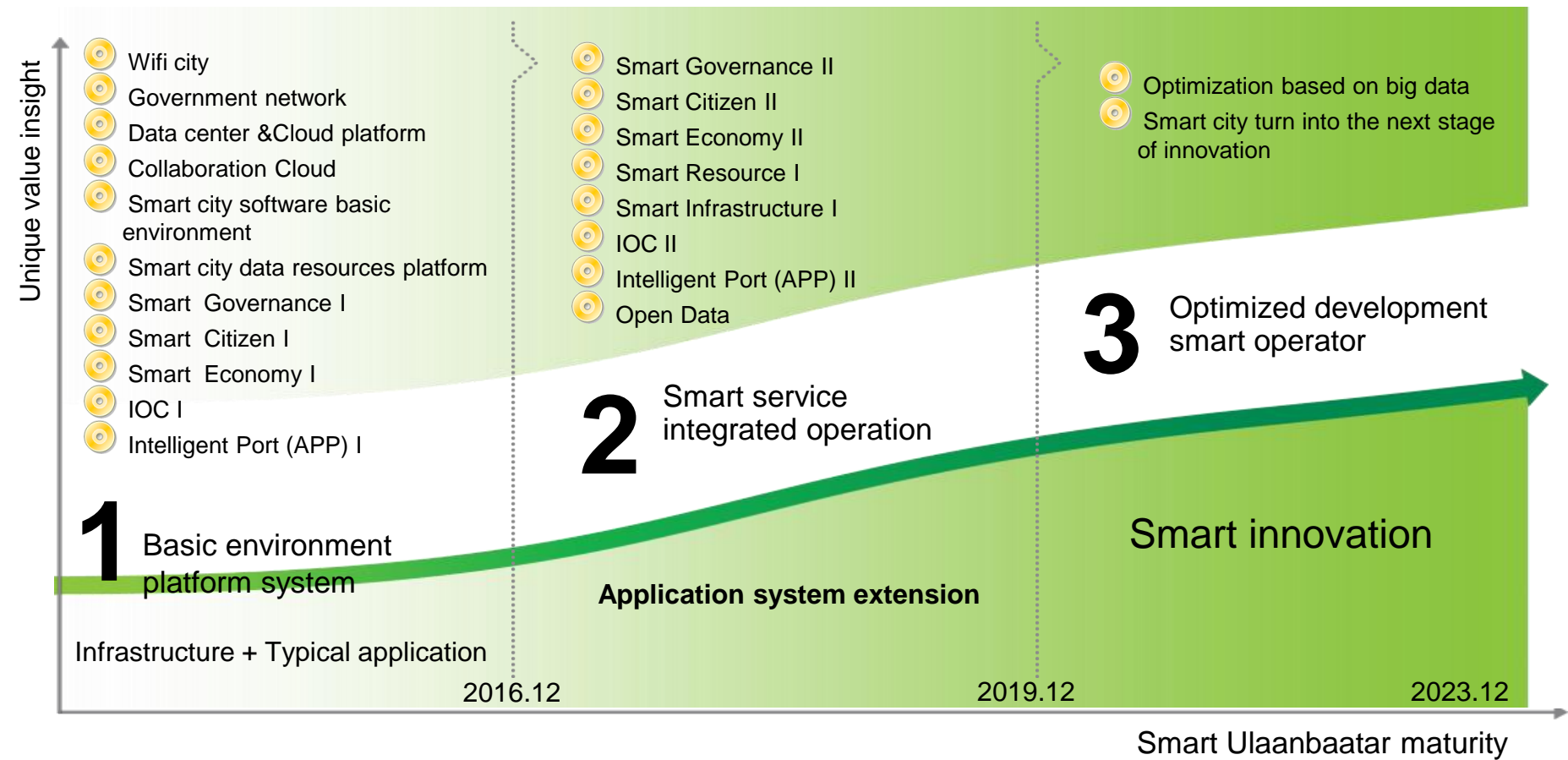
Smart Ulaanbaatar Conceptual Model



Supporting the overall architecture of Smart Ulaanbaatar



Smart Ulaanbaatar implementation route





Education, Audiovisual and Culture Executive Agency

Erasmus+ : Higher Education - International Capacity Building



Evaluation Report

ERASMUS + Capacity-building in Higher Education

Call for proposals EAC/A05/2017

Proposal number:	598317-EPP-1-2018-1-BG-EPPKA2-CBHE-JP
Proposal title:	SMARTCITY: Innovative Approach Towards A Master Program On Smart Cities Technologies
Applicant organisation:	TECHNICAL UNIVERSITY OF SOFIA

Professor Narantsetseg.Ya
Ulaanbaatar, Mongolia
05 Dec 2019



GENERAL AGREEMENT FOR ACADEMIC COOPERATION
BETWEEN
RIGA TECHNICAL UNIVERSITY, Riga, Latvia
AND
MONGOLIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

Riga Technical University, 1, Kalku Street, Riga LV 1658, Latvia, represented by Prof. dr. habil. Leonīds Ribickis, Rector of Riga Technical University, and **Mongolian University of Science and Technology**,^{8*} khoroo, Baga Toiruu 34, Sukhbaatar district, Ulaanbaatar, Mongolia, represented by Ochirbat Baatar, Rector of Mongolian University of Science and Technology, hereinafter jointly referred to as Parties, and individually – Party, establish this General Agreement (hereinafter termed as the Agreement) to foster international cooperation in education and research.

1. Both parties agree to encourage the following activities, in particular to promote international academic cooperation:
 - (a) Exchange of educational and research materials, publications, and academic information;
 - (b) Exchange of faculty and research scholars;
 - (c) Exchange of students;
 - (d) Joint research and meetings for education and research.

Sustainability and Cooperation

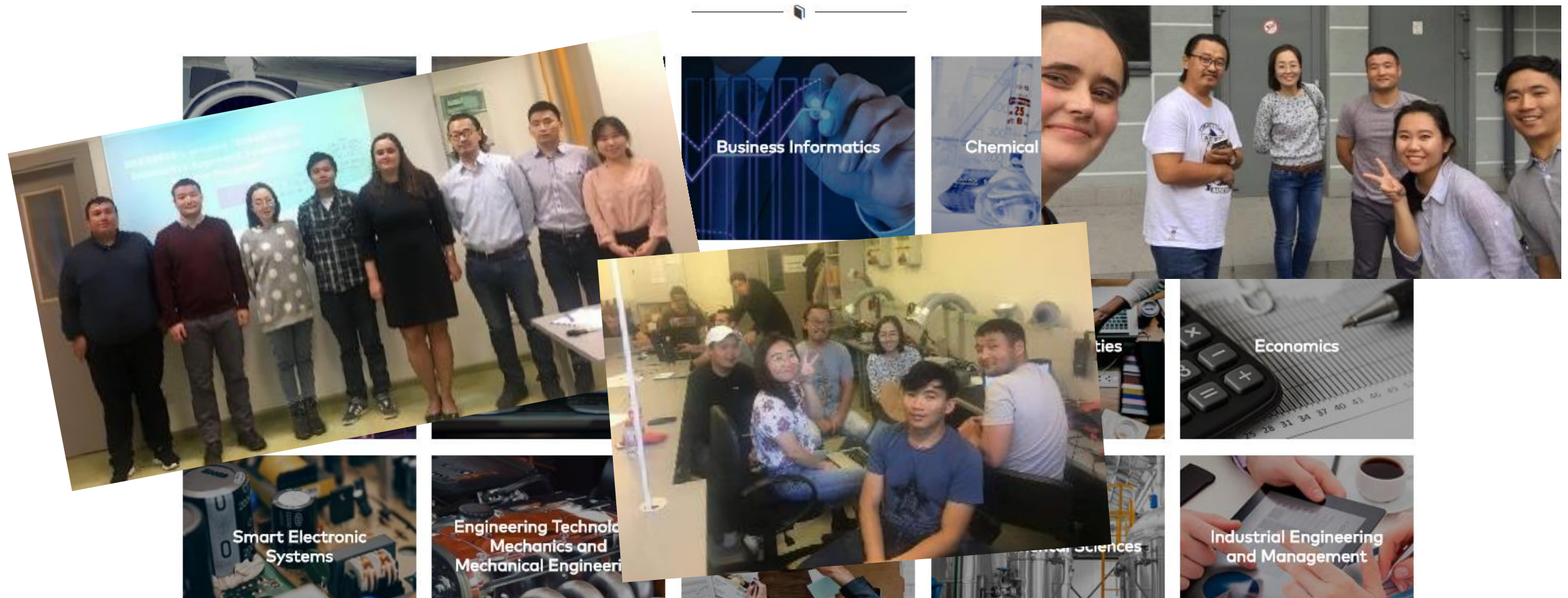


GENERAL AGREEMENT FOR ACADEMIC COOPERATION
BETWEEN
RIGA TECHNICAL UNIVERSITY, Riga, Latvia
AND
MONGOLIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

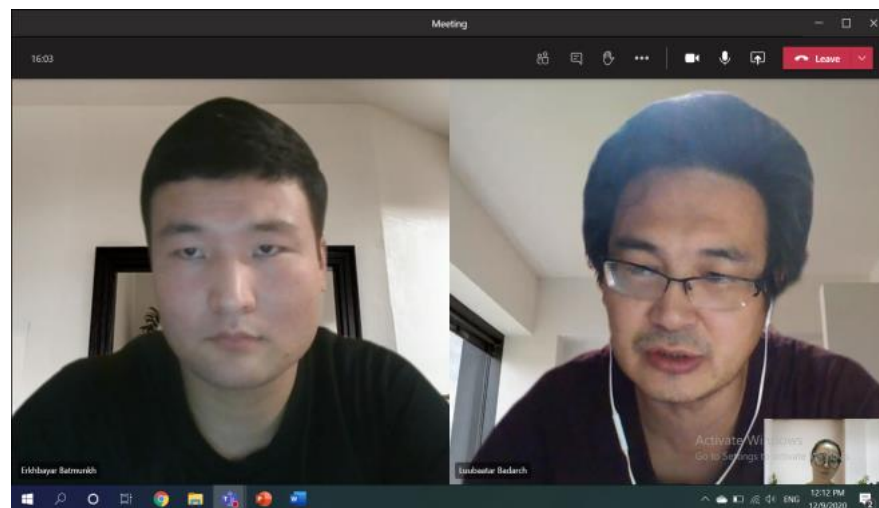
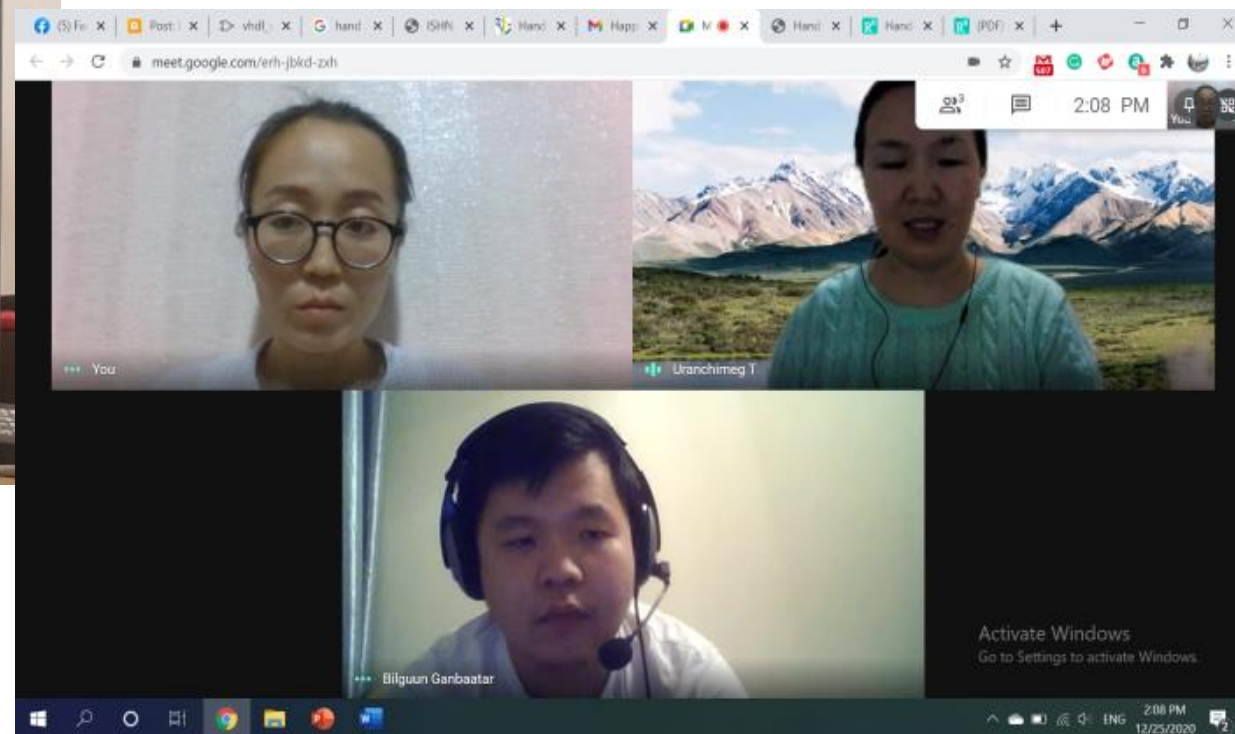
Riga Technical University, 1, Kalku Street, Riga LV 1658, Latvia, represented by Prof. dr. habil. Leonīds Ribickis, Rector of Riga Technical University, and **Mongolian University of Science and Technology**,^{8*} khoroo, Baga Toiruu 34, Sukhbaatar district, Ulaanbaatar, Mongolia, represented by Ochirbat Baatar, Rector of Mongolian University of Science and Technology, hereinafter jointly referred to as Parties, and individually – Party, establish this General Agreement (hereinafter termed as the Agreement) to foster international cooperation in education and research.

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 - (c) Exchange of students;
 - (d) Joint research and meetings for education and research.

MASTER STUDY PROGRAMMES IN ENGLISH



DDMP on SCT /2020-2021 Academic Year/



Sections of the Project (49)/ Work Plan



According to Work Plan, we need to implement 28 activities including everyday project administration within first project year.



**MONGOLIAN UNIVERSITY OF
SCIENCE AND TECHNOLOGY**

МОНГОЛ УЛСЫН ШИНЖЛЭХ УХААН ТЕХНОЛОГИЙН ИХ СУРГУУЛЬ



SMARTCITY

Innovative Approach Towards a Master
Program on Smart Cities Technologies

Co-funded by the
Erasmus+ Programme
of the European Union



CLOUD UNIVERSITY
GO TO INNOVATION