

Course Requirements and Registration Priorities (Master), Fall 2020

#	Abbr	Title	Cr(US)	Cr(ECTS)	PreRequisite	CoRequisite	AntiRequisite	1st priority registration	2nd priority registration	3rd priority registration	4th priority registration
GSB											
GSB											
1	GSBF 501	Team Building and Business Communications	1	2							
2	GSBF 511	Applied Data Analytics I	2.5	5							
3	GSBF 512	Principles of Finance	2.5	5							
4	GSBF 516	Financial Markets and Institutions	2	4							
5	GSBF 517	Macroeconomics for Finance	2.5	5							
6	GSBF 522	Entrepreneurial Finance	2	4							
7	GSBF 533	Islamic Banking and Finance	2	4							
8	GSBF 535	Insurance and Actuarial Science	2	4							
9	MBA 01	Consequential Leadership	1	2							
10	MBA 02	Business Mathematics and Business Computer Application	1	2							
11	MBA 03	Financial Accounting	2	4							
12	MBA 04	Probability and Statistics	2	4							
13	MBA 05	Business Communication	2	4							
14	MBA 07	Managerial Effectiveness	2	4							
15	MBA 08	Managerial Economics	2	4							
16	MBA 12	Operations Management	2	4				For GSB programs only! Registration by School admin.			
17	MBA 16	Entrepreneurship	2	4							
18	MBA 20	Practicum Project	2.5	5							
19	MBAE 14	Innovation Process	2	4							
20	MBAE 17	China Business Environment	2	4							
21	MBAE 2	Emerging Markets Strategy	2	4				For GSB programs only! Registration by School admin.			

22	MBAE 20	Marketing Research	2	4							
23	MBAE 8	Leadership	2	4				For GSB programs only! Registration by School admin.			
24	MSF 02	Thesis Preparation Seminar	2	4							
25	MSF 03	Advanced Econometrics	2	4				For GSB programs only! Registration by School admin.			
26	MSF 04	Private Equity	2	4				For GSB programs only! Registration by School admin.			
27	MSF 08	Microeconomics for Finance	2.5	5							
28	MSF 09	Corporate Governance	2	4							
GSPP											
Master in Public Administration											
29	MPA 602	Public Administration in Theory and Practice	4	8				1 year GSPP Public Administration			
30	MPA 603	Economic Applications for Public Managers	4	8				1 year GSPP Public Administration			
31	MPA 605	Research Methods for Public Managers	4	8				1 year GSPP Public Administration			
32	MPA 699	Master's Project with Overseas Component	0	0				2 year GSPP Public Administration			
33	MPE 617	Institutions and development policies	4	8				2 year GSPP Public Administration, 2 year GSPP Public Policy	Public Administration, Public Policy	GSB, GSE, SEDS, SMG, SSH, SoM	
34	MPE 625	Ethical Challenges in Governance	4	8				2 year GSPP Public Administration, 2 year GSPP Public Policy	Public Administration, Public Policy	GSB, GSE, SEDS, SMG, SSH, SoM	
35	MPE 626	Open Governance	4	8				2 year GSPP Public Administration, 2 year GSPP Public Policy	Public Administration, Public Policy	GSB, GSE, SEDS, SMG, SSH, SoM	
36	MPE 627	Public Policy and Health Issues	4	8				2 year GSPP Public Administration, 2 year GSPP Public Policy	Public Administration, Public Policy	GSB, GSE, SEDS, SMG, SSH, SoM	
37	MPE 628	Good Governance and Corruption	4	8				2 year GSPP Public Administration, 2 year GSPP Public Policy	Public Administration, Public Policy	GSB, GSE, SEDS, SMG, SSH, SoM	
38	MPE 629	Political Economy of State- Building	4	8				2 year GSPP Public Administration, 2 year GSPP Public Policy	Public Administration, Public Policy	GSB, GSE, SEDS, SMG, SSH, SoM	
39	MPE 639	International Financial Policy	4	8				2 year GSPP Public Administration, 2 year GSPP Public Policy	Public Administration, Public Policy	GSB, GSE, SEDS, SMG, SSH, SoM	

40	MPE 646	Communications for Public Leadership	4	8				2 year GSPP Public Administration, 2 year GSPP Public Policy	Public Administration, Public Policy	GSB, GSE, SEDS, SMG, SSH, SoM	
41	MPE 671	Game Theory and Public Policy	4	8				2 year GSPP Public Administration, 2 year GSPP Public Policy	Public Administration, Public Policy	GSB, GSE, SEDS, SMG, SSH, SoM	
42	MPE 680	Urban Mobility Policy in the Age of the Smart City	4	8				2 year GSPP Public Administration, 2 year GSPP Public Policy	Public Administration, Public Policy	GSB, GSE, SEDS, SMG, SSH, SoM	
43	MPE 685	Water Resources Policy and Management	4	8				2 year GSPP Public Administration, 2 year GSPP Public Policy	Public Administration, Public Policy	GSB, GSE, SEDS, SMG, SSH, SoM	
Master in Public Policy											
44	MPP 601	Microeconomics and Public Policy	4	8				1 year GSPP Public Policy			
45	MPP 611	Statistics for Public Policy	4	8				1 year GSPP Public Policy			
46	MPP 612	Public Policy Research and Evaluation	4	8				1 year GSPP Public Policy			
47	MPP 621	Public Policy and Analysis	4	8				1 year GSPP Public Policy			
48	MPP 631	Politics and Public Policy	4	8				2 year GSPP Public Policy			
49	MPP 699-0	Policy Analysis Exercise with Overseas Component	0	0	MPP 613 Policy Research Design and Methods (1301) (C- and above)			2 year GSPP Public Policy			
GSE											
MA in Multilingual Education											
50	EDML 601	Introduction to Linguistics	3	6				1 year GSE MA in Multil.Education			
51	EDML 610	Foundations of Multilingual Education	3	6				1 year GSE MA in Multil.Education			
52	EDML 613	The Multilingual School	3	6				2 year GSE MA in Multil.Education			
53	EDML 614	Multilingual curriculum development and assessment	3	6				2 year GSE MA in Multil.Education			
54	EDML 627	Application of CLIL in Teaching	3	6				2 year GSE MA in Multil.Education			
55	EDML 629	Multiliteracies: Teaching Language and Literacy for a Multilingual Context	3	6				2 year GSE MA in Multil.Education			
56	EDML 690	Thesis Research I	3	6				2 year GSE MA in Multil.Education			
MSc Educational Leadership HE											

57	EDHE 609	Introduction to Educational Leadership: Higher Education	3	6				1 year GSE Educ.Leadership			
58	EDHE 610	Applying Educational Leadership in Kazakhstan	3	6				1 year GSE Educ.Leadership			
59	EDHE 623	Transformations of Higher Education in Eurasia/Post-Soviet States	3	6				1 year GSE Educ.Leadership			
60	EDHE 691	Thesis Seminar II	3	6				2 year GSE Educ.Leadership			
61	EDUC 505	Academic English 1	1.5	3				1 year GSE Educ.Leadership			
62	EDUC 507	Academic English III	1.5	3				2 year GSE Educ.Leadership			
63	EDUC 510	Advanced English for Education Professionals I	3	6				1 year GSE MA in Multil.Education			
64	EDUC 512	English for Thesis Writing I	3	6				2 year GSE MA in Multil.Education			
65	EDUC 571	Basic Kazakh	3	6				1 year GSE Educ.Leadership, 1 year GSE MA in Multil.Education, 1 year GSE PhD Education			
66	EDUC 602	Educational Context and Reform in Kazakhstan	3	6				1 year GSE Educ.Leadership, 1 year GSE MA in Multil.Education			
67	EDUC 607	Research Methods 1	3	6				1 year GSE Educ.Leadership, 1 year GSE MA in Multil.Education			
MSc Educational Leadership IE											
68	EDIE 609	Introduction to Educational Leadership: Inclusive Education	3	6				1 year GSE Educ.Leadership			
69	EDIE 651	Inclusive Education: Policy Perspectives	3	6				1 year GSE Educ.Leadership			
70	EDIE 652	Curriculum Design: perspectives on Addressing Barriers to Teaching and Learning (Including SEN)	3	6				1 year GSE Educ.Leadership			
71	EDIE 691	Thesis Seminar II	3	6				2 year GSE Educ.Leadership			
MSc Educational Leadership SE											
72	EDSE 609	Introduction to Educational Leadership: School Education	3	6				1 year GSE Educ.Leadership			

73	EDSE 623	Foundations of Early Childhood Education	3	6				1 year GSE Educ.Leadership		
74	EDSE 633	Curriculum Design and Management	3	6				1 year GSE Educ.Leadership		
75	EDSE 691	Thesis Seminar II	3	6				2 year GSE Educ.Leadership		
76	EDSE 693	Thesis Seminar IV	9	18				2 year GSE Educ.Leadership		
SoM										
MMM										
77	MMMM 501	Molecular Basis of Infection	3	6				1 year Gr SOM Molecular Medicine		
78	MMMM 502	Molecular Basis of Cancer	3	6				1 year Gr SOM Molecular Medicine		
79	MMMM 503	Bioethics in Research: Principles and Practice	3	6				2 year Gr SOM Molecular Medicine		
80	MMMM 504	Molecular Basis of Genetic Disease	3	6				1 year Gr SOM Molecular Medicine		
81	MMMM 513	Molecular Basis of Neurological Disorders	3	6				2 year Gr SOM Molecular Medicine		
82	MMMM 603	Recombinant Drugs	3	6				2 year Gr SOM Molecular Medicine		
83	MMMM 605	Developmental Biology	3	6				2 year Gr SOM Molecular Medicine		
MPTOX										
84	MPTX 501	Organ system and common diseases	3	6				1 year Gr SOM Pharmacology and Toxicology		
85	MPTX 502	Cellular Communications	3	6				1 year Gr SOM Pharmacology and Toxicology		
86	MPTX 503	Principles of Pharmacology and Toxicology	3	6		MPTX 501 Organ system and common diseases (5841) (C and above)		1 year Gr SOM Pharmacology and Toxicology		
87	MPTX 505	Drug Discovery I	3	6		MPTX 503 Principles of Pharmacology and Toxicology (5843) (C and above)		1 year Gr SOM Pharmacology and Toxicology		
88	MPTX 604E	Scientific Writing	3	6				1 year Gr SOM Pharmacology and Toxicology, 2 year Gr SOM Molecular Medicine	Molecular Medicine	

MSMR

89	MSMR 501	Musculoskeletal System	3	6				1 year Gr SOM Sports Medicine and Rehabilitation			
90	MSMR 503	Exercise Genetics, Physiology and Endocrinology	3	6				1 year Gr SOM Sports Medicine and Rehabilitation			
91	MSMR 504	Pharmacology in Sports and Rehabilitation	3	6				1 year Gr SOM Sports Medicine and Rehabilitation			
92	MSMR 505	Exercise and Biomechanics	3	6				1 year Gr SOM Sports Medicine and Rehabilitation			
93	MSMR 510	Biostatistics and Epidemiology	3	6				1 year Gr SOM Sports Medicine and Rehabilitation			

Public Health

94	PUBH 501	Principles of Public Health Problem Solving	3	6				1 year Gr SOM Public Health			
95	PUBH 511	Inferential Biostatistics	3	6				1 year Gr SOM Molecular Medicine, 1 year Gr SOM Public Health			
96	PUBH 521	Principles of Analytical Epidemiology	3	6				1 year Gr SOM Public Health, 2 year Gr SOM Molecular Medicine			
97	PUBH 528	Qualitative Research Methods	3	6				1 year Gr SOM Public Health			
98	PUBH 531	Emerging Infectious Diseases	3	6				1 year Gr SOM Public Health, 2 year Gr SOM Molecular Medicine			
99	PUBH 552	Principles of Health Economics and Policy	3	6	PUBH 551 Health Services Management, Health Economic and Health Policy (3696) (C and above)			2 year Gr SOM Public Health			
100	PUBH 561	Graduate Research Seminar I	3	6				2 year Gr SOM Public Health			
101	PUBH 601	Health Education and Promotion	3	6				2 year Gr SOM Public Health			
102	PUBH 633	Methods in Public Health	3	6				2 year Gr SOM Public Health			
103	PUBH 681	Master's Project Planning	3	6				2 year Gr SOM Public Health			

SMG**Mining Engineering**

104	MINE 501	Foundations of Mining	3	6				Mining Engineering	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
105	MINE 502	Geology for Mining Engineers	3	6				Mining Engineering	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
106	MINE 503	Applied Geostatistics	3	6				Mining Engineering	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
107	MINE 504	Mine Geomechanics	3	6				Mining Engineering	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
108	MINE 505	Advanced Mine Ventilation	3	6				Mining Engineering	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
109	MINE 601	Mine Management and Sustainability	3	6				Mining Engineering	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
110	MINE 602	Mine Maintenance and Services	3	6	MINE 502 Geology for Mining Engineers (3691) (C- and above)			Mining Engineering	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
111	MINE 605	Mechanized Excavation and Tunnelling	3	6				Mining Engineering	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
112	MINE 606	Underground Hard Rock Geotechnical Engineering	3	6				Mining Engineering	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
113	MINE 690	Thesis I	6	12				Mining Engineering			
Petroleum Engineering											
114	PETE 501	Foundations of Petroleum Engineering	3	6				Petroleum Engineering			
115	PETE 502	Petroleum Geology	3	6				Petroleum Engineering			
116	PETE 503	Fluid Flow Through Porous Media	3	6				Petroleum Engineering			
117	PETE 504	Advanced Formation Evaluation	3	6				Petroleum Engineering			
118	PETE 505	Advanced Drilling Engineering	3	6				Petroleum Engineering			
119	PETE 509	Advanced Well Testing and Evaluation	3	6				Petroleum Engineering			
120	PETE 600	Thesis I	6	12				Petroleum Engineering			
121	PETE 601	Petroleum Data Analytics	3	6				Petroleum Engineering			
122	PETE 602	Research Seminar	3	6				Petroleum Engineering			
SSH											
Area Studies											
123	EAS 500	Introduction to Eurasia	4	8				Eurasian Studies	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		

124	EAS 501	General Methodology	4	8				Eurasian Studies	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
125	EAS 503	Thesis I	7.5	15	EAS 500 Introduction to Eurasia (1632) (C- and above) AND EAS 501 General Methodology (1633) (C- and above) AND EAS 502 Disciplinary Methodology (1379) (C- and above)			2 year Gr SSH Eurasian Studies			
126	EAS 511	Independent Study in Eurasian Studies	4	8				Instructor's Permission Required. Registration through Add Course form only!			
Area Studies, Political Science and International Relations, Sociology and Anthropology											
127	SOC 514/PLS 514/EAS 506	Qualitative Research Methods	4	8				Eurasian Studies, Political Science and International Relations	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
Biological Science											
128	BIOL 520	Statistical Methods in Life Sciences	3	6				Biological Sciences	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
129	BIOL 550	Structural and Molecular Biology in Health and Disease	3	6				Biological Sciences	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
130	BIOL 560	Molecular Biology of Prokaryotic Cells	3	6				Biological Sciences	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
131	BIOL 592	Graduate Research Seminar	3	6				Biological Sciences	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
132	BIOL 599	Master's Thesis Research	0	0				Biological Sciences	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
133	BIOL 631	Synthetic Biology	3	6				Biological Sciences	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
134	BIOL 634	Advanced Cancer Biology	3	6				Biological Sciences	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
135	BIOL 635	Hot Topics in Life Sciences	3	6				Biological Sciences	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
136	BIOL 670	Gene Therapy	3	6				Biological Sciences	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
137	BIOL 691	Master's Thesis Research Proposal	3	6				2 year Gr SSH Biological Sciences and Technologies			
Chemistry											

138	CHEM 510	Principles of Physical Chemistry	3	6				Chemistry	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
139	CHEM 520	Applied Analytical Chemistry	3	6				Chemistry	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
140	CHEM 522	Analytical Environmental Chemistry	3	6	CHEM 520 Applied Analytical Chemistry (5267) (C and above)			Chemistry	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
141	CHEM 530	Inorganic Structures and Reaction Mechanisms	3	6				Chemistry	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
142	CHEM 531	Nanochemistry and Functional Nanomaterials	3	6				Chemistry	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
143	CHEM 541	Medicinal Chemistry and Drug Design	3	6	CHEM 540 Organic Reactions and Mechanisms (5460) (C and above)			Chemistry	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
144	CHEM 543	Structural Identification of Organic Compounds	3	6				Chemistry	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
145	CHEM 550	Selected Topics in Chemistry	3	6				Chemistry	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
146	CHEM 591	Scientific Methods in Chemistry	3	6				Chemistry	SSH	GSB, GSE, GSPP, SEDS, SMG, SoM	
147	CHEM 691	Thesis Proposal	3	6				Chemistry			
Communication and Composition											
148	WCS 501	Science Communication	3	6				SMG, SSH, SoM			
Economics											
149	ECON 501	Microeconomics I	4	8				Economics	SEDS, SMG, SSH, SoM		
150	ECON 502	Macroeconomics I	4	8				Economics	SEDS, SMG, SSH, SoM		
151	ECON 503	Introduction to Contract Theory and Auctions	4	8				Economics	SEDS, SMG, SSH, SoM		
152	ECON 505	Behavioral and Experimental Economics	4	8				Economics	SEDS, SMG, SSH, SoM		
153	ECON 511	Statistics	4	8				Economics	SEDS, SMG, SSH, SoM		
154	ECON 512	Mathematical Economics	4	8				Economics	SEDS, SMG, SSH, SoM		
155	ECON 515	Industrial Organization	4	8	ECON 531 Econometrics (2505) (C- and above)			Economics	SEDS, SMG, SSH, SoM		

156	ECON 517	Development Economics	4	8				Economics	SEDS, SMG, SSH, SoM		
157	ECON 528	Wages and the Labor Market	4	8	ECON 521 Microeconomic Theory II (2506) (C- and above) AND ECON 531 Econometrics (2505) (C- and above)			Economics	SEDS, SMG, SSH, SoM		
158	ECON 532	Applied Econometrics	4	8				Economics	SEDS, SMG, SSH, SoM		
159	ECON 589	Thesis I	4	8				2 year Gr SSH Economics			
History, Philosophy and Religious Studies											
160	HST 535	Stalinist Central Asia	4	8				Eurasian Studies	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
History, Philosophy and Religious Studies, Kazakh Language and Turkic Studies											
161	HST 554/TUR 554	Turkestan in the Nineteenth Century	4	8				Eurasian Studies	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
Languages, Literature and Linguistics											
162	LING 570	Multilingualism and Language Contact	4	8				GSB, GSE, GSPP, SEDS, SMG, SSH, SoM			
Mathematics											
163	MATH 510	Measure Theory and Applications	3	6				Applied Mathematics	SEDS, SSH	GSB, GSE, GSPP, SMG, SoM	
164	MATH 519	Scientific Computing	3	6				Applied Mathematics	SEDS, SSH	GSB, GSE, GSPP, SMG, SoM	
165	MATH 540	Statistical Learning	3	6				Applied Mathematics	SEDS, SSH	GSB, GSE, GSPP, SMG, SoM	
166	MATH 542	Statistical Programming	3	6				Applied Mathematics	SEDS, SSH	GSB, GSE, GSPP, SMG, SoM	
167	MATH 571	Advanced Nonlinear Differential Equations	3	6				Applied Mathematics	SEDS, SSH	GSB, GSE, GSPP, SMG, SoM	
168	MATH 592	Research Seminar	3	6				Applied Mathematics	SEDS, SSH	GSB, GSE, GSPP, SMG, SoM	
169	MATH 676	Advanced Partial Differential Equations with Applications	3	6				Applied Mathematics	SEDS, SSH	GSB, GSE, GSPP, SMG, SoM	
170	MATH 691	Thesis Proposal	3	6	MATH 592 Research Seminar (5760) (C- and above)			2 year Gr SSH Applied Mathematics			
Physics											
171	PHYS 502	Teaching Practicum	3	6				Physics	SEDS, SSH	GSB, GSE, GSPP, SMG, SoM	

172	PHYS 505	Classical Mechanics	3	6				Physics	SEDS, SSH	GSB, GSE, GSPP, SMG, SoM	
173	PHYS 511	Computational Modeling and Simulation	3	6				Physics	SEDS, SSH	GSB, GSE, GSPP, SMG, SoM	
174	PHYS 515	Classical Electrodynamics	3	6				Physics	SEDS, SSH	GSB, GSE, GSPP, SMG, SoM	
175	PHYS 530	Solid State Physics	4	8				Physics	SEDS, SSH	GSB, GSE, GSPP, SMG, SoM	
176	PHYS 550	Advanced Mathematical Physics	3	6				Physics	SEDS, SSH	GSB, GSE, GSPP, SMG, SoM	
177	PHYS 591	Research Methods	3	6				Physics	SEDS, SSH	GSB, GSE, GSPP, SMG, SoM	
178	PHYS 600	Thesis Research	0	0				Physics			
Political Science and International Relations											
179	PLS 511	Advanced Research I	4	8				Political Science and International Relations	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
180	PLS 512	Scientific Research in International Relations	4	8	PLS 511 Advanced Research I (1631) (C- and above) AND PLS 510 Advanced Research I (1946) (C- and above) AND PLS 550 Core Seminar in IR (1372) (C- and above)			Political Science and International Relations	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
181	PLS 515	Maximum Likelihood Models	4	8	PLS 510 Advanced Research I (1946) (C- and above)			Political Science and International Relations	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
182	PLS 540	Core Seminar in Comparative Politics	4	8				Political Science and International Relations	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
183	PLS 549	Politics and Governance of the Gulf	4	8				Political Science and International Relations	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
184	PLS 550	Core Seminar in IR	4	8				Political Science and International Relations	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
185	PLS 558	International Organization	4	8	PLS 550 Core Seminar in IR (1372) (C- and above)			Political Science and International Relations	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
186	PLS 581	Independent Study in Political Science	4	8				Instructor's Permission Required. Registration through Add Course form only!			

187	PLS 598	MA Thesis I	6	12				Political Science and International Relations		
SSH										
188	SSH 503	Laboratory Practicum	3	6	SST 501 Teaching and Learning (2260) (C- and above) AND SEDS 502 Teaching Practicum (2824) (C- and above)			Applied Mathematics		
Sociology and Anthropology										
189	ANT 521	Sport and Construction of Identity	4	8				GSB, GSE, GSPP, SEDS, SMG, SSH, SoM		
190	SOC 510	Social Inequality	4	8				Eurasian Studies	GSB, GSE, GSPP, SEDS, SMG, SSH, SoM	
SEDS										
Chemical and Materials Engineering										
191	MBME 601	Master Thesis I	12	24				2 year Gr SEDS Biomedical Engineering		
192	MBME 603	Biomaterials Science & Engineering	3	6				1 year Gr SEDS Biomedical Engineering, 2 year Gr SEDS Biomedical Engineering	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics	Biomedical Sciences, Chemical Engineering, Civil Engineering, Computer Science, Electrical Engineering, Life Sciences, Mathematics, Mechanical Engineering, Mining Engineering, Petroleum Engineering, Physics, Robotics Engineering, Science, Engineering and Technology

193	MBME 604	Biosensors	3	6				1 year Gr SEDS Biomedical Engineering	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics	Biomedical Sciences, Chemical Engineering, Civil Engineering, Computer Science, Electrical Engineering, Life Sciences, Mathematics, Mechanical Engineering, Mining Engineering, Petroleum Engineering, Physics, Robotics Engineering, Science, Engineering and Technology
194	MBME 610	Anatomy and Physiology for Biomedical Engineers	3	6				1 year Gr SEDS Biomedical Engineering	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics	Biomedical Sciences, Chemical Engineering, Civil Engineering, Computer Science, Electrical Engineering, Life Sciences, Mathematics, Mechanical Engineering, Mining Engineering, Petroleum Engineering, Physics, Robotics Engineering, Science, Engineering and Technology
195	MCHME 601	Master Thesis I	12	24				2 year Gr SEDS Chemical and Materials Engineering		

196	MCHME 603	Advanced Materials Processing	3	6				1 year Gr SEDS Chemical and Materials Engineering	1 year Gr SEDS, 1 year Gr SMG, 2 year Gr SEDS, 2 year Gr SMG	Biomedical Sciences, Chemical Engineering, Civil Engineering, Computer Science , Electrical Engineering, Life Sciences, Mathematics, Mechanical Engineering, Mining Engineering, Petroleum Engineering, Physics, Robotics Engineering, Science, Engineering and Technology
197	MCHME 604	Advanced Materials Characterization Methods	3	6				1 year Gr SEDS Chemical and Materials Engineering	1 year Gr SEDS, 1 year Gr SMG, 2 year Gr SEDS, 2 year Gr SMG	Biomedical Sciences, Chemical Engineering, Civil Engineering, Computer Science , Electrical Engineering, Life Sciences, Mathematics, Mechanical Engineering, Mining Engineering, Petroleum Engineering, Physics, Robotics Engineering, Science, Engineering and Technology

198	MCHME 605	Advanced Chemical Reaction Engineering	3	6				1 year Gr SEDS Chemical and Materials Engineering	1 year Gr SEDS, 1 year Gr SMG, 2 year Gr SEDS, 2 year Gr SMG	Biomedical Sciences, Chemical Engineering, Civil Engineering, Computer Science , Electrical Engineering, Life Sciences, Mathematics, Mechanical Engineering, Mining Engineering, Petroleum Engineering, Physics, Robotics Engineering, Science, Engineering and Technology
199	MCHME 702	Biofilms Science and Engineering	3	6				2 year Gr SEDS Chemical and Materials Engineering	1 year Gr SEDS, 1 year Gr SMG, 2 year Gr SEDS, 2 year Gr SMG	Biomedical Sciences, Chemical Engineering, Civil Engineering, Computer Science , Electrical Engineering, Life Sciences, Mathematics, Mechanical Engineering, Mining Engineering, Petroleum Engineering, Physics, Robotics Engineering, Science, Engineering and Technology

200	MCHME 714	Computational Materials Engineering	3	6				2 year Gr SEDS Chemical and Materials Engineering	1 year Gr SEDS, 1 year Gr SMG, 2 year Gr SEDS, 2 year Gr SMG	Biomedical Sciences, Chemical Engineering, Civil Engineering, Computer Science , Electrical Engineering, Life Sciences, Mathematics, Mechanical Engineering, Mining Engineering, Petroleum Engineering, Physics, Robotics Engineering, Science, Engineering and Technology	
Civil Engineering											
201	MSC 600	Research Methods and Ethics	3	6				1 year Gr SEDS Engineering Management	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics		
202	MSC 601	Technical Communication	3	6				1 year Gr SEDS Biomedical Engineering, 1 year Gr SEDS Chemical and Materials Engineering, 1 year Gr SEDS Civil and Environmental Engineering, 1 year Gr SEDS Computer Science, 1 year Gr SEDS Electrical and Computer Engineering, 1 year Gr SEDS Mechanical and Aerospace Engineering, 1 year Gr SEDS Robotics and Mechatronics	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Electrical and Computer Engineering, Mechanical and Aerospace Engineering, Robotics		

203	MSC 602	Advanced Applied Mathematics	3	6				1 year Gr SEDS Biomedical Engineering, 1 year Gr SEDS Chemical and Materials Engineering, 1 year Gr SEDS Civil and Environmental Engineering, 1 year Gr SEDS Electrical and Computer Engineering, 1 year Gr SEDS Mechanical and Aerospace Engineering	Mining Engineering, Petroleum Engineering	Biomedical Sciences, Chemical Engineering, Civil Engineering, Computer Science, Electrical Engineering, Life Sciences, Mathematics, Mechanical Engineering, Mining Engineering, Petroleum Engineering, Physics, Robotics Engineering, Science, Engineering and Technology	
204	MSC 615	Advanced Statistics and Probability	3	6				1 year Gr SEDS Engineering Management			
Civil and Environmental Engineering											
205	EMEM 507	Project Management	3	6				1 year Gr SEDS Engineering Management	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics		
206	EMEM 509	Systems Engineering	3	6				2 year Gr SEDS Engineering Management	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics		

207	E MEM 523	Supply Chain Management	3	6				2 year Gr SEDS Engineering Management	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics		
208	E MEM 533	Engineering Management and Engineering Economy	3	6				1 year Gr SEDS Engineering Management	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics		
209	E MEM 537	Engineering Decision Tools	3	6				2 year Gr SEDS Engineering Management	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics		

210	EMEM 538	Knowledge and Innovation Management	3	6				1 year Gr SEDS Engineering Management	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics		
211	EMEM 539	Big Data and Information Management	3	6				2 year Gr SEDS Engineering Management	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics		
212	EMEM 542	Production and Service Operations Management	3	6				2 year Gr SEDS Engineering Management	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics		
213	MCEE 601	Master Thesis I	12	24	MCEE 600 Research Seminar (4692) (P)			2 year Gr SEDS Civil and Environmental Engineering	1 year Gr SEDS, 1 year Gr SMG, 2 year Gr SEDS, 2 year Gr SMG		

214	MCEE 603	Finite Element Methods	3	6				1 year Gr SEDS Civil and Environmental Engineering, 1 year Gr SEDS Mechanical and Aerospace Engineering	Biomedical Engineering, Chemical Engineering, Chemical and Materials Engineering, Civil Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Electrical and Electronic Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics		
215	MCEE 604	Advanced Soil Mechanics	3	6				1 year Gr SEDS Civil and Environmental Engineering	1 year Gr SEDS, 1 year Gr SMG, 2 year Gr SEDS, 2 year Gr SMG		
216	MCEE 605	Advanced Environmental Chemistry	3	6				1 year Gr SEDS Civil and Environmental Engineering	1 year Gr SEDS, 1 year Gr SMG, 2 year Gr SEDS, 2 year Gr SMG		
217	MCEE 705	Environmental Modeling Development	3	6				2 year Gr SEDS Civil and Environmental Engineering	1 year Gr SEDS, 1 year Gr SMG, 2 year Gr SEDS, 2 year Gr SMG		
218	MCEE 708	Advanced Foundation Engineering	3	6				2 year Gr SEDS Civil and Environmental Engineering	1 year Gr SEDS, 1 year Gr SMG, 2 year Gr SEDS, 2 year Gr SMG		
219	MCEE 709	Building Information Modeling in Construction	3	6				2 year Gr SEDS Civil and Environmental Engineering	1 year Gr SEDS, 1 year Gr SMG, 2 year Gr SEDS, 2 year Gr SMG		
Computer Science											
220	CSCI 501	Software Principles and Practice	3	6				Computer Science, Robotics	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering	SSH	
221	CSCI 511	Theory of Computation	3	6				Computer Science	SEDS	SSH	
222	CSCI 515	Modeling and Simulation for Computer Science	3	6				Computer Science, Data Science	SEDS	SSH	

223	CSCI 585	Computer Vision	3	6				Computer Science, Data Science	SEDS	SSH	
224	CSCI 594	Deep Learning	3	6				Computer Science, Data Science	SEDS	SSH	
225	CSCI 693	Thesis Proposal	3	6	SEDS 591 Research Methods (3184) (C- and above)			2 year Gr SEDS Computer Science			
226	DS 501	Fundamentals of Data Science	3	6				Data Science			
227	DS 502	Probability and Statistics for Data Science	3	6				Data Science			
228	DS 507	Database Management Systems	3	6				Data Science	Computer Science		
229	DS 551	Process and Project Management	3	6				Data Science	SEDS	SSH	
230	DS 552	Data-Driven Innovation	3	6				Data Science	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Robotics	Applied Mathematics, Biological Sciences, Chemistry, Economics, Eurasian Studies, Physics, Political Science and International Relations	
231	DS 693	Thesis Proposal	3	6	SEDS 591 Research Methods (3184) (C- and above)			2 year Gr SEDS Data Science			
232	SEDS 503	Laboratory Practicum	3	6	SEDS 502 Teaching Practicum (2824) (P)			2 year Gr SEDS Computer Science, 2 year Gr SEDS Robotics and Mechatronics			
233	SEDS 591	Research Methods	3	6				1 year Gr SEDS Computer Science, 1 year Gr SEDS Data Science, 1 year Gr SEDS Robotics and Mechatronics	Computer Science, Data Science, Robotics		
Electrical and Computer Engineering											
234	MECE 601	Master Thesis I	12	24				2 year Gr SEDS Electrical and Computer Engineering			

235	MECE 603	Advanced Data Structures and Algorithms	3	6				1 year Gr SEDS Electrical and Computer Engineering	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics	Biomedical Sciences, Chemical Engineering, Civil Engineering, Computer Science , Electrical Engineering, Life Sciences, Mathematics, Mechanical Engineering, Mining Engineering, Petroleum Engineering, Physics, Robotics Engineering, Science, Engineering and Technology
236	MECE 605	Statistics and Probability for Electrical and Computer Engineers	3	6				1 year Gr SEDS Electrical and Computer Engineering	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics	Biomedical Sciences, Chemical Engineering, Civil Engineering, Computer Science , Electrical Engineering, Life Sciences, Mathematics, Mechanical Engineering, Mining Engineering, Petroleum Engineering, Physics, Robotics Engineering, Science, Engineering and Technology

237	MECE 724	System Modelling and Control	3	6				1 year Gr SEDS Electrical and Computer Engineering	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics	Biomedical Sciences, Chemical Engineering, Civil Engineering, Computer Science, Electrical Engineering, Life Sciences, Mathematics, Mechanical Engineering, Mining Engineering, Petroleum Engineering, Physics, Robotics Engineering, Science, Engineering and Technology
238	MECE 725	Smart Grids and Energy Systems	3	6	MECE 700 Industrial and Commercial Power System (4810) (D and above)			2 year Gr SEDS Electrical and Computer Engineering	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics	Biomedical Sciences, Chemical Engineering, Civil Engineering, Computer Science, Electrical Engineering, Life Sciences, Mathematics, Mechanical Engineering, Mining Engineering, Petroleum Engineering, Physics, Robotics Engineering, Science, Engineering and Technology

239	MECE 726	Modern Semiconductor Devices and Systems	3	6				2 year Gr SEDS Electrical and Computer Engineering	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics	Biomedical Sciences, Chemical Engineering, Civil Engineering, Computer Science, Electrical Engineering, Life Sciences, Mathematics, Mechanical Engineering, Mining Engineering, Petroleum Engineering, Physics, Robotics Engineering, Science, Engineering and Technology
Mechanical and Aerospace Engineering										
240	MMAE 601	Master Thesis I	12	24	MMAE 600 Research Seminar (4703) (P)			2 year Gr SEDS Mechanical and Aerospace Engineering		
241	MMAE 603	Modern Control Engineering	3	6				1 year Gr SEDS Mechanical and Aerospace Engineering	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics	
242	MMAE 605	Advanced Manufacturing Processes and Strategies	3	6				1 year Gr SEDS Mechanical and Aerospace Engineering	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics	

243	MMAE 710	Space Structures Design	3	6				2 year Gr SEDS Mechanical and Aerospace Engineering	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics			
244	MMAE 713	Computational Fluid Structure Interaction	3	6				2 year Gr SEDS Mechanical and Aerospace Engineering	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering, Mining Engineering, Petroleum Engineering, Robotics			
Robotics and Mechatronics												
245	ROBT 501	Robot Manipulation and Mobility	3	6				Robotics	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering			
246	ROBT 503	Dynamic Systems and Control	3	6				Robotics	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering			

247	ROBT 613	Brain-Machine Interfaces	3	6				Robotics	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering		
248	ROBT 615	Optimal Control and Planning	3	6	ROBT 501 Robot Manipulation and Mobility (2263) (C- and above) AND ROBT 503 Dynamic Systems and Control (2264) (C- and above)			Robotics	Biomedical Engineering, Chemical and Materials Engineering, Civil and Environmental Engineering, Computer Science, Data Science, Electrical and Computer Engineering, Engineering Management, Industrial and Systems Engineering, Mechanical and Aerospace Engineering		
249	ROBT 691	Thesis Proposal	6	12				2 year Gr SEDS Robotics and Mechatronics			