**American University of Central Asia**

**Liberal Arts and Sciences Department**

**Mathematical Modeling in Social and Natural Sciences Concentration**

**CHECKLIST FOR ADMITS 2023**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **General Education Courses** | | | | | | |
| **Course Name** | **Course abbr.** | **Course ID** | **Credits** | **Semester** | **Prerequisites** | **Comments** |
| **Academic Orientation program:**  **August 21- September 3, 2023** |  |  | **2\*** |  |  | **Outside of 240** |
| First Year Seminar I |  |  | 4 |  |  |  |
| First Year Seminar II |  |  | 4 |  |  |  |
| Introduction to Philosophy I (part of FYS) |  |  | 2 |  |  |  |
| Introduction to Philosophy II (part of FYS) |  |  | 2 |  |  |  |
| English Composition I |  |  | 6 |  |  |  |
| English Composition II |  |  | 6 |  |  |  |
| Kyrgyz Language and Literature I |  |  | 4 |  |  |  |
| Kyrgyz Language and Literature II |  |  | 4 |  |  |  |
| Russian Language I |  |  | 2 |  |  |  |
| Russian Language II |  |  | 2 |  |  |  |
| History of Kyrgyzstan |  |  | 4 |  |  |  |
| Geography of Kyrgyzstan |  |  | 2 |  |  |  |
| Manas Studies |  |  | 2 |  |  |  |
| Mathematics and Quantitative Reasoning:  *Linear Algebra and Analytical Geometry* | MAT 131.2 | 3828 | 6 | 1 | none |  |
| Natural Sciences/Second Year Seminar\*\*  *Physics. Computer Modeling.* | MAT-202.1 |  | 6 | 1 |  |  |
| Arts/Second Year Seminar\*\* |  |  | 12 |  |  |  |
| Humanities/Second Year Seminar\*\* |  |  | 12 |  |  |  |
| Social Sciences/Second Year Seminar\*\* |  |  | 12 |  |  |  |
| Sports |  |  | 400 hours/0 credits |  |  |  |
| **Total GenEd credits** |  |  | **92 [2] credits** |  |  |  |

**\*** Credits earned for the Academic Orientation program are not included into 240 credits for graduation.

\*\*All students in their 2nd year must take one Second Year Seminar. This seminar substitutes for one required 6-credit course in either Humanities, Social Sciences, Arts or Natural Science.

\*\*\*One 6-credit course in Major requirements could be counted towards General Education requirements.

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| **Major Requirements** | | | | | | |
| **LAS Core Courses – 24 credits** | | | | | | |
| **Course Name** | **Course abbr.** | **Course ID** | **Credits** | **Semester** | **Prerequisites** | **Comments** |
| Concepts of Modern Art/Arts | LAS/ ART 230 | 4257 | 6 | 1 | - | Can be counted towards Arts requirement in the General Education program |
| World Literature/Humanities | LAS/ HUM 220 | 4977 | 6 | 2 | - | Can be counted towards Humanities requirement in the General Education program |
| Concepts of Modern Sciences/Natural Sciences | LAS/ NTR 100 | 3110 | 6 | 1 | - | Can be counted towards Natural Sciences requirement in the General Education program |
| Globalization and Social Sciences/Social Sciences | LAS/ SS 102 | 3314 | 6 | 2 | - | Can be counted towards Social Sciences requirement in the General Education program |
| **Concentration Required Courses – 48 credits** | | | | | | |
| Discrete mathematics and mathematical logic I | COM 227 | 3129 | 6 |  | none |  |
| Mathematical Analysis I for AMI/SFW | MAT 223.2 | 3855 | 6 | 2 | MAT 131.2 3828 |  |
| Introduction to programming | COM 122 | 5682 | 6 |  | none |  |
| The theory of probabilities and mathematical statistics | MAT 307 | 3215 | 6 |  | MAT 131.2 3828 |  |
| Computer architecture | COM 410.1 | 3268 | 6 |  | COM-223.1 3114 | (pre-registration) |
| Senior Project/Thesis I | MAT 480 | 3966 | 3 | 7 | MAT-370 3864 |  |
| Senior Project/Thesis II | MAT 481 | 3967 | 3 | 8 | MAT-480 3966 |  |
| Research Methods in Applied Mathematics | MAT 370 | 3864 | 6 | 6 | MAT-316.2 3365 |  |
| Internship | MAT 380  MAT 479 | 4121  4120 | 3+3 |  | none |  |
| **Elective Courses in the Concentration - 30 credits from the following list:** | | | | | | |
| **Course Name** | **Course abbr.** | **Course ID** | **Credits** | **Semester** | **Prerequisites** | **Comments** |
| Database | COM 213 | 4773 | 6 |  | COM-119 4357 |  |
| Ordinary differential equations | MAT 332 | 3700 | 6 |  | MAT-233.2 3855 |  |
| Operating Systems | COM 341.1 | 3325 | 6 |  | COM-410.1 3268 | (pre-registration) |
| Numerical Methods | MAT 407 | 3214 | 6 |  | MAT-233.2 3855,  COM-118/122 |  |
| Mathematical models in natural and social sciences: | | |  |  |  |  |
| Math Modeling in Economics | MAT 333 | 3701 | 6 | 7 | MAT-233.2 3855 |  |
| Mathematical Modeling in Geophysics | MAT 420 | 4118 | 6 | 8 | MAT-410 3968 |  |
| Game Theory | MAT/ECO 317 | 3453 | 6 |  | MAT-233.2 3855 |  |
| One 300 or 400 level elective course |  |  | 6 |  |  |  |
| **Other courses outside of major = 70 credits.** | | | | | | |
| **Total Number of Credits** |  |  | **240** |  |  |  |

**Order of study for 2023 admits**

|  |  |  |  |
| --- | --- | --- | --- |
| **Academic Orientation Program [2 credits]** | | | |
| **1st semester (30 credits)** | | **2nd semester (30 credits)** | |
| First Year Seminar I  English Composition for Liberal Arts I  Introduction to Philosophy I (part of FYS I) – 2 cr | 12 | First Year Seminar II  English Composition for Liberal Arts II  Introduction to Philosophy II (part of FYS II) – 2 cr | 12 |
| Linear Algebra and Analytic Geometry for AMI/SFW | 6 | Mathematical Analysis I for AMI/SFW | 6 |
| Concepts of Modern Sciences | 6 | World Literature | 6 |
| Physics.Computer Modeling | 6 | Elective Course | 6 |
| Sport | 0 | Sport | 0 |
| **3rd semester (30 credits)** | | **4th semester (30 credits)** | |
| Concepts of Modern Art | 6 | Globalization and Social Sciences | 6 |
| Elective Course | 6 | The Theory of Probabilities and Math. Statistics | 6 |
| Introduction to Programming | 6 | History and Geography of Kyrgyzstan | 6 |
| Discrete Mathematics and Mathematical Logic I\* | 6 | Computer Architecture | 6 |
| Kyrgyz language and literature – 4 cr.  Russian Language – 2 cr. | 6 | Kyrgyz language and literature – 4 cr.  Russian Language – 2 cr. | 6 |
| Sport | 0 | Sport | 0 |
| **5th semester (30 credits)** | | **6th semester (30 credits)** | |
| Ordinary Differential Equations | 6 | Numerical Methods | 6 |
| Operating Systems | 6 | Research Methods in Applied Mathematics | 6 |
| General Education Course | 6 | General Education Course | 6 |
| General Education Course | 6 | General Education Course | 6 |
| Elective Course: Database | 6 | Elective Course | 6 |
| **SUMMER: Internship** | | | |
| **7th semester (30 credits)** | | **8th semester (30 credits)** | |
| Senior thesis seminar I | 3 | Senior thesis seminar II | 3 |
| Gen Edu course | 6 | Gen Edu course | 6 |
| Elective Course: Math Modeling in Economics | 6 | Elective Course: Mathematical Modeling in Geophysics | 6 |
| Internship | 3+3 | Elective Course | 6 |
| Elective Course | 6 | Elective Course | 6 |

## Graduation requirements:

1. Earn at least 240 credits (+credit hours earned for program internships)
   1. Complete all General Education requirements;
   2. Complete all requirements for at least one major;
   3. Earn no more than 102 credits of introductory (100-level) courses;
   4. Complete at least 18 elective credits outside of a student’s major and General Education program;
   5. Complete the required number of internship credits (the number of credits is determined by each department);
   6. Pass all state graduation examinations;
   7. Successfully complete and defend a senior thesis/project;
   8. Receive no "F" or "N/p" grades in the final semester;

To earn an overall GPA of at least 2.0.